FEBRUARY 15, 1960

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

## Copper, Brass Mills Draw Battle Lines on Import Challenge

## How to Get the Most Out of Scrap

## Metalworking's the Favorite Nephew As Uncle Sam Updates Post Offices

## Hollow Core Dies Get Cold Air Blast And Slash Die Quenching Time

## Profile Check Insures Strip Quality

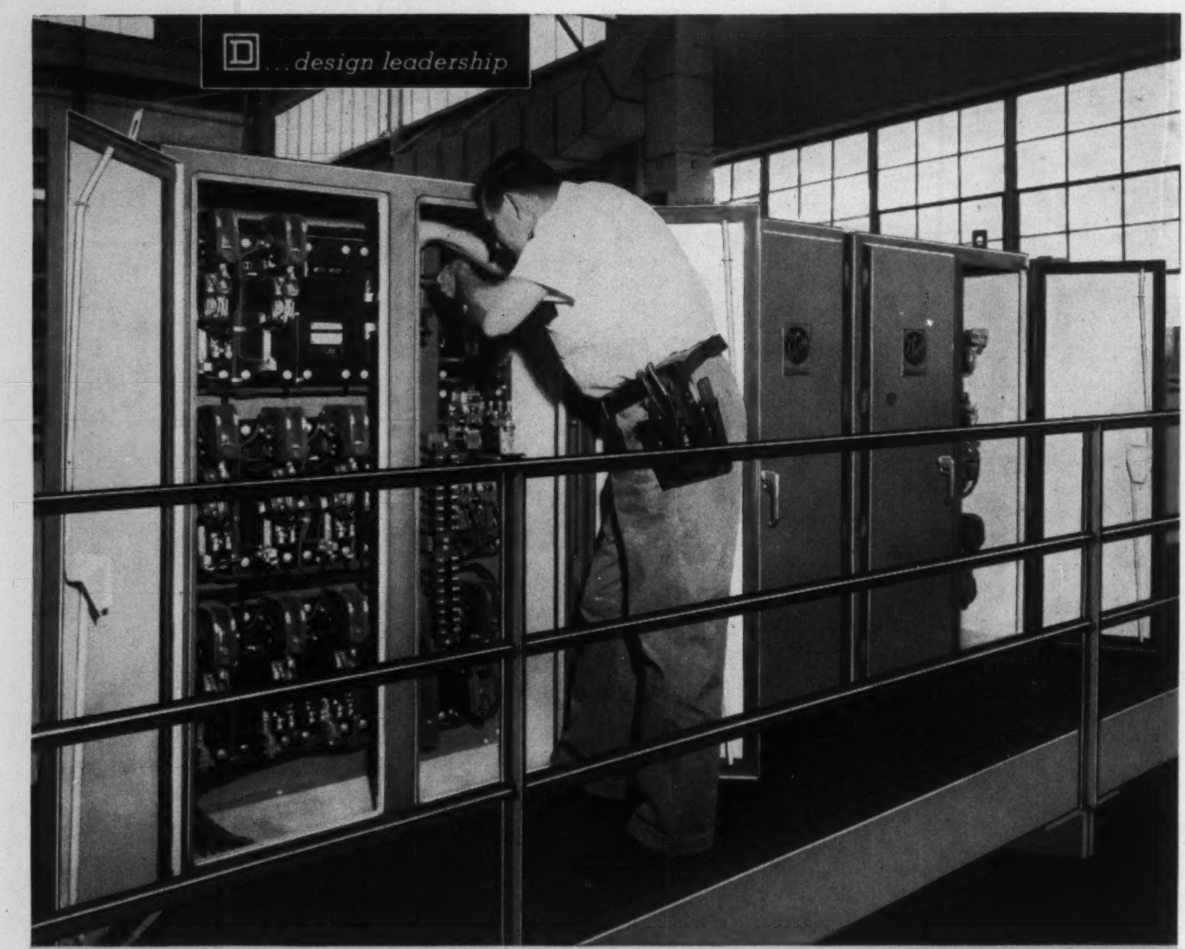
## Luria Counts on Research to Win Greater Scrap Use by Steelmakers

## Slip Casting Broadens Powdered Metal Horizons

The technique removes size limitations and permits formation of hollow parts and shapes with thin or tapering walls. The sintered parts have densities similar to those produced by press compacting. Mold characteristics are important. So is the selection of particle size, since there is no application of pressure. For details of the slip casting process and examples of parts which can be formed by it, see Page 120.

**COMPLETE CONTENTS**
TURN PAGE

**METALWORKING OUTLOOK**
PAGE 63



# NEW! EC&M Front-Connected DC Control reduces catwalk width up to 20 inches

• When space is important, EC&M front-connected control can save you up to 20 inches of catwalk width. Moreover, the controllers are 10% to 15% lighter, can be backed up against girders. The result—a reduction in crane weight.

These new front-connected controllers provide the easiest maintenance of any available. All wiring and control components are accessible from the front, with ample working space inside the cabinet.

You get extra safety, too. Control components are mounted on insulated bases which in turn are mounted on panel studs projecting from the rear of the cabinet. The result is maximum insulation to ground.

EC&M front-connected control is available for single-motor DC drives up to 225 hp, with 2, 3 or 4 decks to suit headroom requirements. Includes exclusive Wright dynamic lowering circuit which gives maximum hook speed without danger of overspeeding.

*Write for Bulletin 6121. Square D Company, EC&M Division, 4500 Lee Road, Cleveland 28, Ohio*

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*wherever electricity is distributed and controlled*

4160

# This Week in STEEL

The Metalworking Weekly

February 15, 1960 Vol. 146 No. 7

## Copper, Brass Mills Fight Import Challenge

Add still another industry that's being forced to take notice of the increasing challenge from imports. Some 21.1 million lb of brass mill products were brought into this country in 1949. The figure jumped to 199.4 million last year. In another familiar pattern, exports have dropped from 47.2 million lb in 1949 to 16.3 million lb last year. PAGE 73

## Get the Most Out of Scrap

Seeking ways to cut costs and boost revenues? Look at your company's metal scrap outturn if you haven't done so lately. Twenty per cent of the metal that goes into the average plant comes out as scrap. But you can turn it to your advantage through a good disposal program. First, see if you can reduce the percentage of scrap from your products. Then, cut the cost of in-plant handling of scrap and upgrade the quality of scrap generated through segregation and other means. Through 12 helpful tips, you can win more efficient production, cut space waste, reduce accident hazards, and add to your revenue. Scrap firms can help, too. Luria Bros. Inc., for example, has launched a research program to boost scrap quality. PAGE 84, PAGE 159

## Metalworking Gains as U. S. Updates Post Offices

Keep your eye on the U. S. Post Office modernization program. It means big business for metalworking. A $500 million plan was approved in 1958 to run for five or six years. In fiscal 1961, $80 million will be spent for equipment, chiefly for sorting, conveying, handling, and canceling. PAGE 76

## Core Dies Slash Die Quenching Time

Die quenching that used to take 10 minutes takes less than 1 minute now. Ryan Aeronautical Co. speeded up the operation through hollow core die design and with a portable tank that takes air from the plant supply, chills it, then sends it into the die. Before the fast quenching, a major stumbling block was the period during which operations had to wait while the part was cooled in the die. PAGE 134

## Profile Check Insures Strip Quality

Rejections are minimized on the 96 in. hot mill at Great Lakes Steel Corp., a division of National Steel Corp. A recording profilometer helps insure high edge-to-edge surface quality on strip coming from the mill. Ridges caused by worn or poorly adjusted rolls (or by clogged water sprays) aren't detected by the mill's x-ray gages, says D. H. Dellinger, vice president (he's the man on the right in the photo). But a profilometer does the job. PAGE 128

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**Index available semiannually.**

**STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.**

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1960 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

**KNOW YOUR ALLOY STEELS . . .**
*This is one of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.*

# Quenching Media for Alloy Steels

In the quenching of alloy steels, several points require consideration, among them being the size and shape of the piece, the type of steel involved, the quenching medium, and proper agitation of the quenching bath.

The composition of the steel has an important bearing on the selection of a quenching medium. As an example: shallow-hardening steels require a fast cooling rate, whereas deeper-hardening steels require progressively slower rates as the alloy content increases.

Three commonly used types of quenching media for alloy steels are water, oil, and air. These are discussed below in the order of quenching severity:

**(1) WATER.** Since shallow-hardening steels require fast quenching rates, water is the quenching medium used to harden them. Agitation is generally used to help in obtaining the desired cooling rate. The use of brine solutions have proven beneficial when sufficient agitation cannot be obtained. It should be noted that the quenching rate drops as water temperature is increased. The range of 70 deg to 100 deg F is recommended.

**(2) OIL.** An oil quench cools more slowly than water, and faster than air. Oil-hardening steels can be hardened with less distortion and greater safety than water-hardening steels. Mineral oils are generally used because of their low cost and relatively stable nature.

**(3) AIR.** If sufficient alloying elements are present, critical cooling rates are decreased to the extent that certain steels can be quenched in either still or forced air.

While the choice of quenching medium is of prime importance, there is another factor that should not be overlooked. This is the agitation of the quenching bath. The more rapidly the bath is agitated, the more rapidly heat is removed from the steel, and the more effective the quench.

Bethlehem metallurgists will gladly help you with any problem related to quenching or other phases of heat-treatment. They are men of long practical experience in this field, and they understand fully the advantages and limitations of each method. Always feel free to call for their services; their time is yours, without obligation.

Remember Bethlehem, too, when you are next in the market for AISI standard alloy steels, special-analysis steels, or carbon grades. We are always in a position to meet your needs promptly.

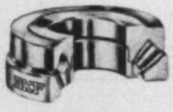
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
*Export Distributor:* Bethlehem Steel Export Corporation

**BETHLEHEM STEEL**

BETHLEHEM STEEL

**REED Instrument Bearing**

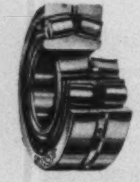
**Angular Contact Bearing**



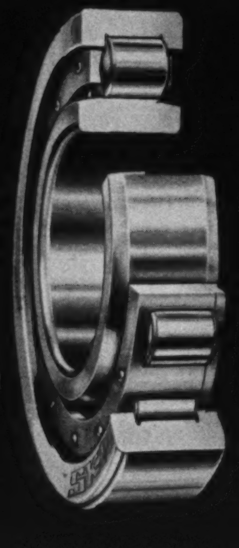
**Spherical Roller Thrust Bearing**

**Tapered Roller Bearing**

**Single Row Deep Groove Ball Bearing**



**Spherical Roller Bearing**



Cylindrical Roller Bearing

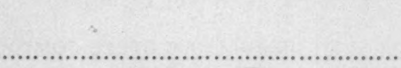
# What's a "special size" in production bearings?

SKF makes so many standard sizes, there's practically no such thing as a "special size" of bearing. They range from tiny instrument bearings right up to four-row tapered roller bearings—and account for almost every possible bore size in-between.

Take SKF's standard cylindrical roller bearing, for example. It's promptly available in 154 sizes of single- and double-row types—for shaft diameters ranging from 1" to 9.5". Every size, in both types, offers high radial capacity in relation to its size and operates at highest speeds because of its very low friction.

So, before you specify a "special size" bearing, call the nearest SKF sales office first. The odds are better than 1,000 to 1 that there's already a standard SKF bearing of exactly the size you need.

6007



*Spherical, Cylindrical, Ball, Tyson Tapered and REED Miniature Bearings*

EVERY TYPE—EVERY USE

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SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

NEW! ECONOMY 100
NEW! ROLL BLANKET
NEW! FOR 16" O.C. FRA
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**You save working capital!** Without large outlays of capital you take immediate possession of all new materials handling equipment. Your present equipment is purchased at full cash value . . . your only actual capital expenditure is one budgeted monthly payment.

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**No more maintenance!** You rent with full maintenance service included. You no longer need to maintain a special repair shop or parts inventory.

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**A tailored system!** A rental contract is prepared only after a thorough study of your specific operation is made. The flexibility of the Clark Rental System provides you with a *basic* program—without frills or extras—which keeps your handling costs to a minimum

**Compare the advantages for yourself!** A booklet describing the rental program in detail, including a cost comparison chart, is available without obligation. For your personal copy, write or wire to the address below.

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*New York 17, N. Y.*

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Family living today is richer, easier because of a bright array of appliances, housewares, and hardware that employ one of the breathtaking Nickeloid Metals. Scores of manufacturers already know the extra beauty, the practical utility, and the production economy made possible by these metals with gleaming finishes of chromium, brass, copper, or nickel. Product designers have combined the functional and the decorative to build faster, more profitable sales. Possibilities are endless. Nickeloid Metals, being completely pre-finished, simplify the entire manufacturing process, with greater profit. Let us set up a workshop session with your executives in design, sales, purchasing, and production. We have sales engineers at nearby sales offices qualified to unfold this fascinating picture. Or write us for descriptive catalog.

# Nickeloid helps make a family's world

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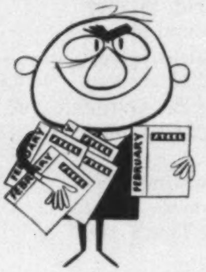
**AMERICAN NICKELOID COMPANY, PERU, ILLINOIS · Plants: Peru, Ill., and Walnutport, Pa.**

STEEL
Servicenter

Please direct all correspondence to attention of Ed Service, STEEL, 1213 W. Third St., Cleveland 13, Ohio.

February 15, 1960

## 30 Days Hath . . .



September, April, June, and November. All the rest have 31, except February. And we never could remember the rest of that rhyme, except to know that February has 29 days this Leap Year, with Feb. 29 being the fifth Monday and the fifth issue date of the month for STEEL.

STEEL hasn't published on a Feb. 29 since 1932. We, of course, rushed to the archives to see what the editors were talking about on that date 28 years ago. The composite steel price was $29.53 (the index is running at 186.8 now). Auto assemblies, the editors reported, fell to 126,500 units in January, 1932 (they reached nearly 690,000 this January). Freight carloadings were at a weekly average of 550,000. They're running at about 600,000 now. That's silent testimony to the growth in truck traffic since 1932.

Yet some things never change. In 1932, the Federal Trade Commission reported progress in its investigations of several metalworking companies. Ford and Chevrolet were in a competitive race.

## Coming Up

What will be special for Feb. 29, 1960? One job we're looking forward to is an opus by Associate Editor Ross Whitehead. It will concern reliability as a new arena for competition.

Ever since missiles came into being, the word, reliability, has been getting increasing play in industrial management circles. Last year, the emphasis started to snowball. Various firms, principally automotive, started dumping millions into reliability campaigns for consumer products. Probably 12 directors of reliability function in the U. S. today; even more do the job but don't have the title.

New emphasis on reliability represents the next management move to win larger shares of a market with products that operate better and last longer.

## Trouble with Reliability

Manufacturers seeking better reliability have to cope with customer usage like this—which is sworn to as true by R. S. Geran, general service manager for Kelvinator Div. of American Motors Corp.:

A lady went into a self-serve laundry, loaded a machine. When the unit was full, she still had some items in her cart, so she stuffed more in. The lid wouldn't close, so she climbed up and sat on it. Then she put her quarter in the slot and lit a cigaret. The manager rushed over to protest. "Madam, you can't possibly get your clothes clean. You'll probably tear some of them and break the washer."

She blew smoke in his face. "Bud, keep your nose out of my washing. It's my two bits in that machine."

## Editorial Demosthenes

The next voice you hear may belong to one of our editors. They have been making speeches with terrific abandon since the first of the year, mainly on the effects of the steel settlement.

Editor Walt Campbell is setting the pace with a rate of better than one a week.

The writers have also been giving exceptional exercise to their larynges (that's the plural of larynx, in case you were wondering) via television and radio. They've appeared several times on all three networks, plus stints on many local news programs at stations in New York to Chicago.

## Reprint Recount

The adding machines are quiet now. STEEL's reprint and tearsheet department reports: In 1959, we received 583 requests for 467,000 reprints of STEEL articles. That compares with 259 requests for 376,000 in 1958 and 230 requests for 375,000 in 1957.

We would like to cite one other figure: We're getting 34.4 letters a business day, commenting on items that ran in the magazine. Many ask for tearsheets.

## For Example

"We certainly appreciated the tearsheets on 'Solving the Manpower Shortage' in the Oct. 26, Nov. 2, 9, and 16 issues (1959) of STEEL," writes Phil S. Paul Jr. of Allis-Chalmers Mfg. Co.'s Graduate Training Dept. "They stirred up so much interest that we want 20 more."

Another example: " 'Plan Trade Show Exhibits

That Sell' (Steel, Feb. 1, p. 51) is both interesting and informative. Facts, comments, and suggestions contained therein have considerable merit and are worthy of consideration in planning an exhibit. Please furnish us six tearsheets"—Robert R. Miller, advertising manager, Harbison-Walker Refractories Co.

Copies of those articles are available, as they are for two other recent best sellers around here—"How to Develop Your Creative Talent," Dec. 28, 1959, p. 53, and "What the Steel Settlement Really Means to You," Jan. 25, p. 33. Write Editorial Service, Steel, Penton Bldg., Cleveland 13, Ohio.

Many of the requests indicate the growing usership of Steel. We'd like to learn more about how our magazine is being used. That's the reason for this contest:

## HERE'S HOW YOU CAN WIN

# $1000 This Month

## in STEEL'S

## Usership Idea of the Month Contest

Tell us, in 300 words or less, how you plan to USE an article or advertisement in this issue (or any other issue published this month—February, 1960) to help you accomplish an important personal or company objective.

Be as specific as you can. If, in the opinion of the judges, yours is the best idea submitted—

## YOU WILL WIN $500

There's more . . . you will win an additional $500 if you submit written proof that you were successful in accomplishing your objective. Proof must be submitted within six months after you are declared winner of Steel's Usership Idea of the Month Award.

Entries will be judged by a committee of Steel editors. All letters become the property of Steel Magazine.

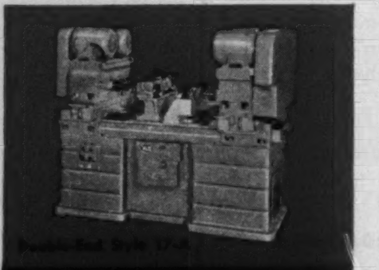
**This Month's Deadline**
**Apr. 1, 1960**

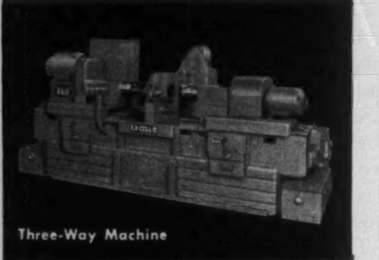
Send your entries to:
**Ed Service, Servicenter**
**STEEL**
1213 W. Third St., Cleveland 13, Ohio

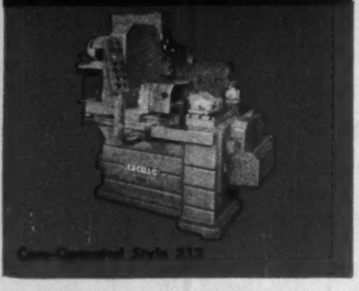
INSTRUMENT PARTS OR HEAVY CASTINGS, SHORT RUNS OR MILLION-LOT ORDERS . . .

AN EX-CELL-O PRECISION BORING MACHINE FOR EVERY NEED

Ex-Cell-O Precision Boring Machines do more jobs, more accurately—Rough, semi-finish and finish Boring • Facing • Turning • Chamfering • Grooving • Taper-boring • Gun-drilling • Contouring







The Ex-Cell-O Catalog lists a wide range of standard Precision Boring Machines that meet your requirements for accuracy, speed, economy and dependability. Or call your local Ex-Cell-O Representative for details on hydraulic-actuated or cam-operated boring machines, single or double-bridge, horizontal or vertical styles, way-type machines and others in the complete line.

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EX-CELL-O
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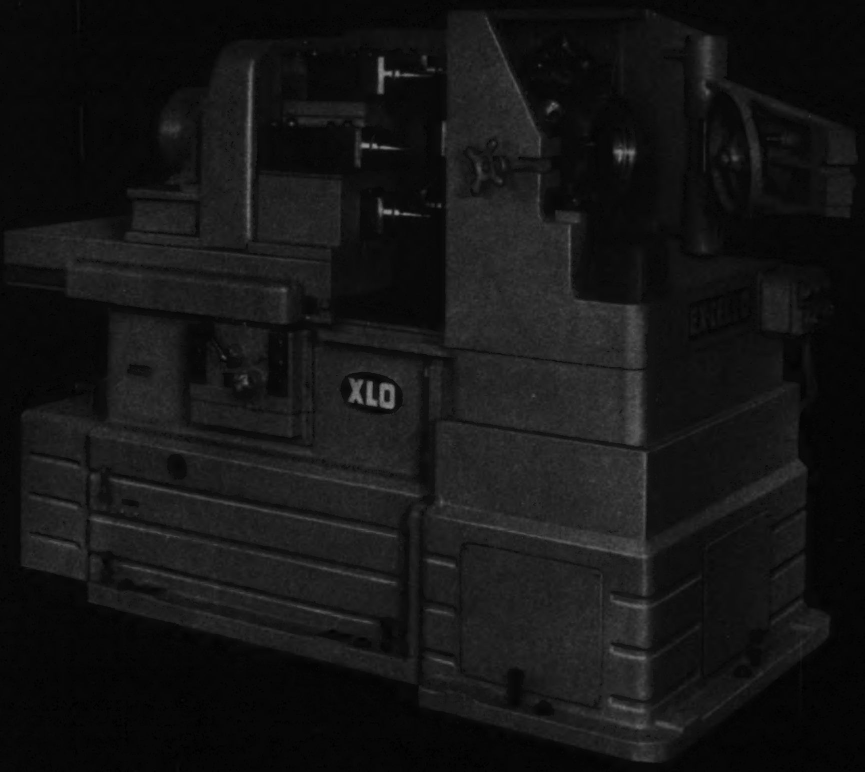
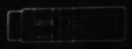
59-40

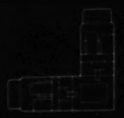


An Ex-Cell-O Way-Type unit can be a special-purpose production machine, or used with other units as an automated machining line. Various arrangements are outlined below.

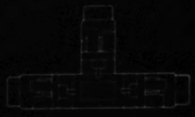


ONE WAY

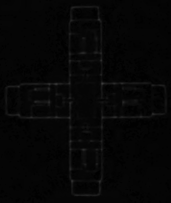
TWO WAYS AT 180°



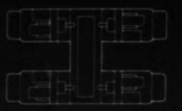
TWO WAYS AT 90°



THREE WAYS



FOUR WAYS



MULTI WAYS

# It's a 'special'— but it's ready to do other jobs, any time!

59-21

## Ex-Cell-O Way-Type units use standard components for economy, flexibility...

**Ex-Cell-O Precision Way-Type Machines let you arrange and re-arrange combinations of standard machine components to create your own special machines for each new job. A self-contained Way unit consists of a base, a slide, and hydraulic power and controls to operate the slide; a universal end section supports the work fixture.**

**The typical single-unit Way Machine above bores and chamfers six holes at one feed stroke in a magnesium aircraft component. Hole locations are held to .001" tolerance, and finish bore diameters are accurate within plus or minus .0005".**

**Your local Ex-Cell-O Representative will welcome the opportunity to suggest other profitable Way Machine applications in your operation. Call him, or contact Ex-Cell-O, Detroit.**

**EX-CELL-O FOR PRECISION XLO**

**EX-CELL-O**
CORPORATION
DETROIT 32, MICHIGAN

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EX-CELL-O PRECISION PRODUCTS INCLUDE: MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS TORQUE ACTUATORS • THREAD AND GROOVE GAGES • GRANITE SURFACE PLATES AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

# *the most DYNAMIC ATTRACTION a show ever had!*

# *at the 1960 PHILADELPHIA*

## 42nd NATIONAL METAL CONGRESS & EXPOSITION

**Philadelphia Trade and Convention Center • Oct. 17-21, 1960**

Steel, the sinew that binds the strength of America, will serve as a magnetic attraction to call attention to **every** area of metals technology, ferrous and nonferrous, at the most metallic of all Metal Shows — the 1960 Philadelphia Metal Show, now blue-printed and ready to grow into its full dimensions. This new emphasis on the essential metals of industry reflects a growing specialization . . . a **focusing** of attention . . . to yield a greater benefit. In the evolution of the Metal Show, the time for such refinement has come. Now it is possible to achieve a concentration on **materials** that is unsurpassed anywhere for an intensive person-to-person interchange of information. The STEEL ARENA is the threshold to a whole new world of metals within the exhibits and technical sessions. The pre-eminence of a Metal Show of these dimensions is worth your closest consideration as an exhibitor — you are invited to share its benefit in any of the eleven areas of metals listed.

### *EXHIBITORS FROM ELEVEN METALS AREAS*

1. Ferrous Metal Producers and Distributors
2. Nonferrous Metal Producers and Distributors
3. Related Engineering Materials
4. Nuclear Materials and Equipment
5. Tool Materials, Cutting-Off and Forming Equipment
6. Industrial Heating Equipment and Supplies
7. Cleaning and Finishing Equipment and Supplies
8. Welding and Joining Equipment and Supplies
9. Testing, Inspection and Control Equipment and Supplies
10. Production and Casting Equipment and Supplies
11. Parts, Forms and Shapes for Design and Applications

**Exhibitors at the Philadelphia Metal Show will gather their customers and prospects from the broad metalworking industry, including automotive, aircraft, appliance, ordnance, farm machinery, electrical machinery, instruments, and miscellaneous metalworking manufacturers . . . creating a thriving, effective, profitable marketplace. If your potential for sales lies in any of these areas, the Metal Show should take priority in your sales plan for maximum impact in the Soaring Sixties.**

**Floor Plan Folders are now available — for complete information, consult the ASM representative nearest to you, or write direct.**

**NEW YORK — OXford 7-2667**
**CLEVELAND — JOrdan 4-2271**
**(Novelty, Ohio)**
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***MAKE PLANS NOW***
***TO EXHIBIT AT THIS GREATEST OF ALL METAL SHOWS!***

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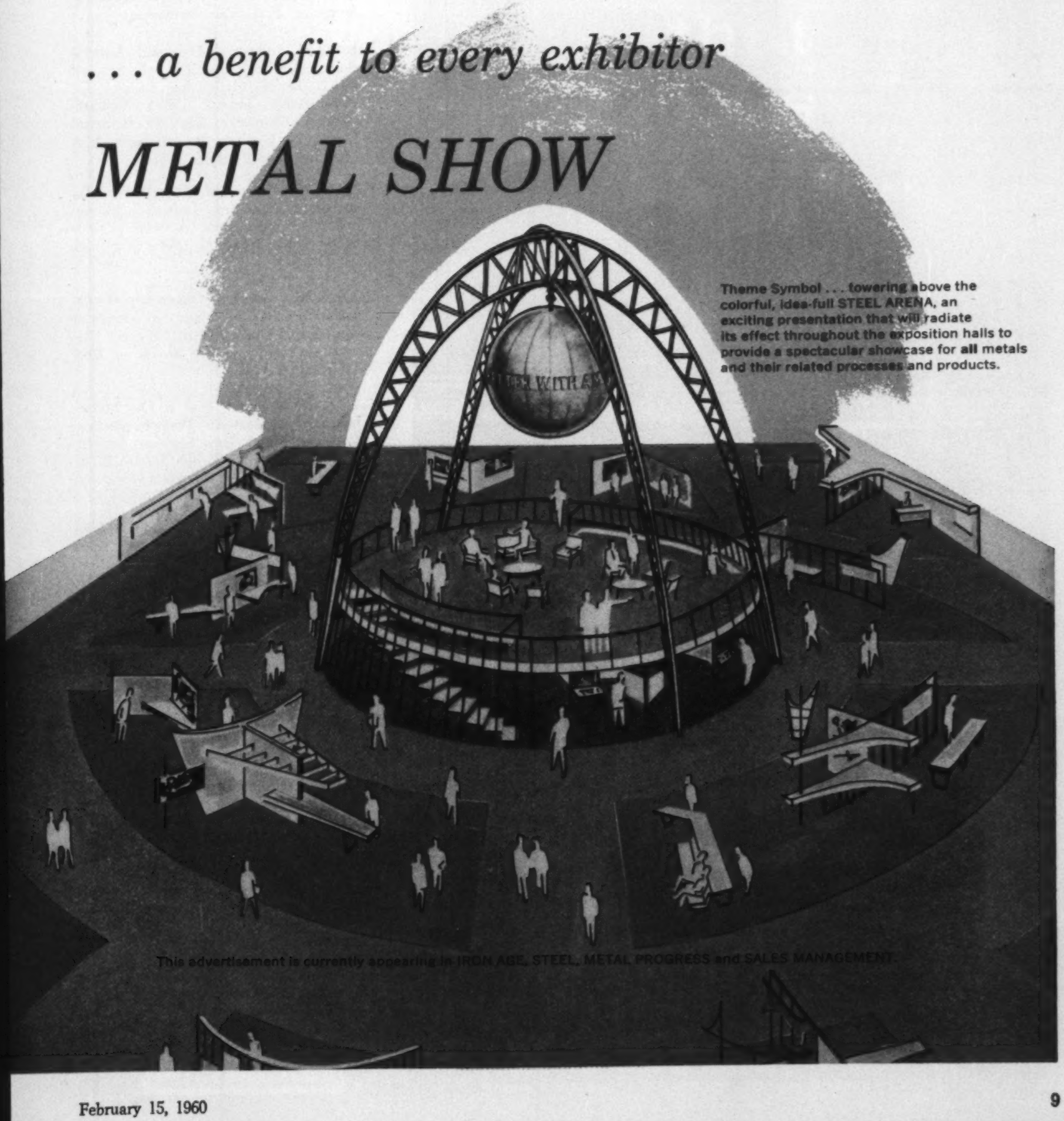
Metals Park • Novelty, Ohio

. . . *a benefit to every exhibitor*

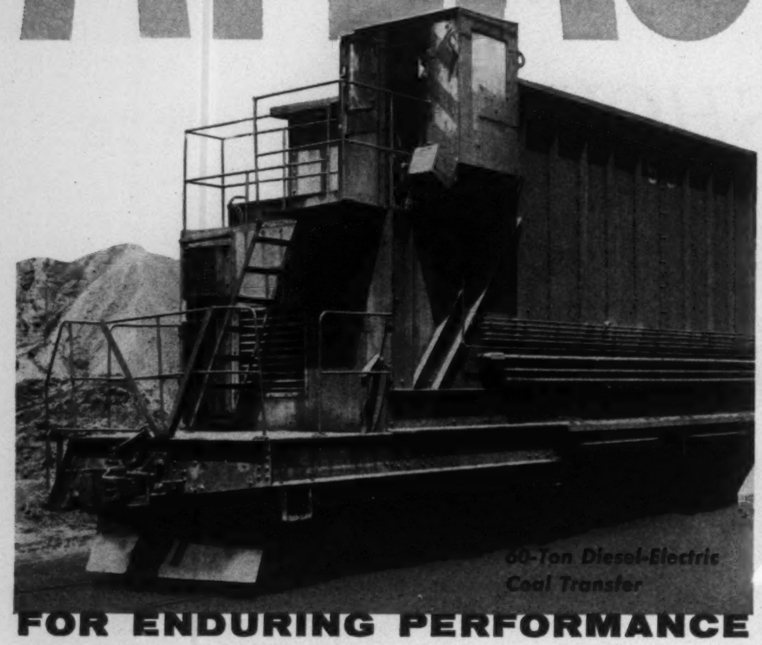
*METAL SHOW*



**Theme Symbol . . . towering above the colorful, idea-full STEEL ARENA, an exciting presentation that will radiate its effect throughout the exposition halls to provide a spectacular showcase for all metals and their related processes and products.**

**This advertisement is currently appearing in IRON AGE, STEEL, METAL PROGRESS and SALES MANAGEMENT.**

ATLAS



FOR ENDURING PERFORMANCE

Atlas Transfer Cars are designed to meet individual production needs of each user, and built with workmanship that assures the ruggedness so necessary for safe, dependable service.

*Since 1896 . . . Engineers-Builders of Ore Transfers . . . Scale Cars . . . Coke Quenchers . . . Coal Larries . . . Door Machines . . . Safety-Type Transfers . . . Storage Battery Locomotives*

**ATLAS CAR & MFG. COMPANY**
1140 IVANHOE ROAD
CLEVELAND 10, OHIO

## CALENDAR
### OF MEETINGS

**Feb. 17-18, Malleable Founders' Society:** Technical and operating conference, Wade Park Manor, Cleveland. Society's address: 781 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

**Feb. 21-24, American Institute of Chemical Engineers:** Winter meeting, Biltmore Hotel, Atlanta, Institute's address: 25 W. 45th St., New York 36, N. Y. Secretary: F. J. Van Antwerpen.

**Feb. 22-25, Industrial Diamond Association:** Annual meeting, Hollywood Beach Hotel, Hollywood Beach, Fla. Association's address: 587A Newark-Pompton Turnpike, Box 175, Pompton Plains, N. J. Executive manager: Mrs. Margaret J. McGinnis.

**Feb. 24-26, American Management Association:** Marketing conference, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y.

**Feb. 24-26, American Management Association:** Research and development conference, Drake Hotel, Chicago. Association's address: 1515 Broadway, New York 36, N. Y.

**Feb. 24-27, National Tool & Die Manufacturers Association:** Winter meeting, Roosevelt Hotel, New Orleans. Association's address: 907 Public Square Bldg., Cleveland 13, Ohio. Executive vice president: George S. Eaton.

**Feb. 24-Mar. 4, Pittsburgh Conference on Analytical Chemistry & Applied Spectroscopy:** Penn-Sheraton Hotel, Pittsburgh, Pa. Information: W. J. Feingold, Semiconductor Dept., Westinghouse Electric Corp., Youngwood, Pa.

**Mar. 6-9, American Society of Mechanical Engineers:** Gas turbine power and hydraulic conference, Rice Hotel, Houston. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

**Mar. 7-8, Steel Founders' Society of America:** Annual meeting, Drake Hotel, Chicago. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Executive vice president: F. Kermit Donaldson.

**Mar. 7-9, Association of Iron & Steel Engineers:** Western meeting, St. Francis Hotel, San Francisco. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.

**Mar. 13-15, National Association of Waste Material Dealers:** Annual meeting, Waldorf-Astoria Hotel, New York. Association's address: 271 Madison Ave., New York 16, N. Y. Administrator: M. J. Mighdoll.

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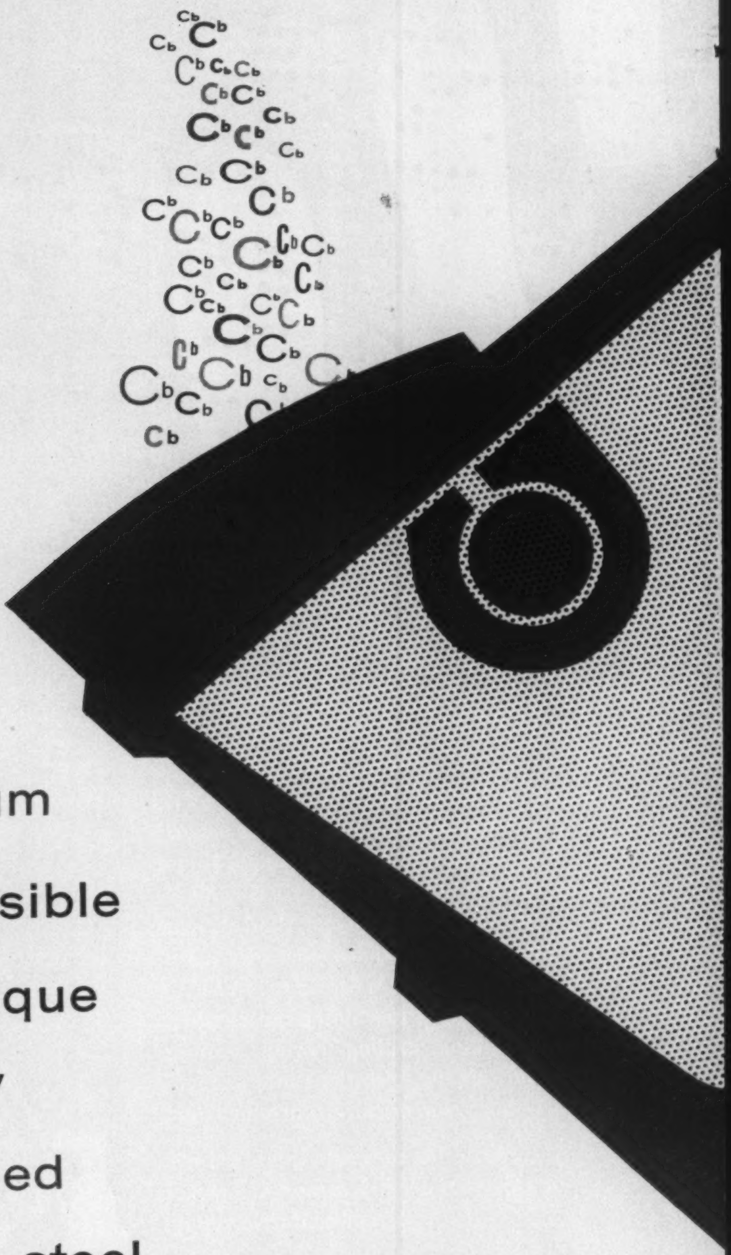

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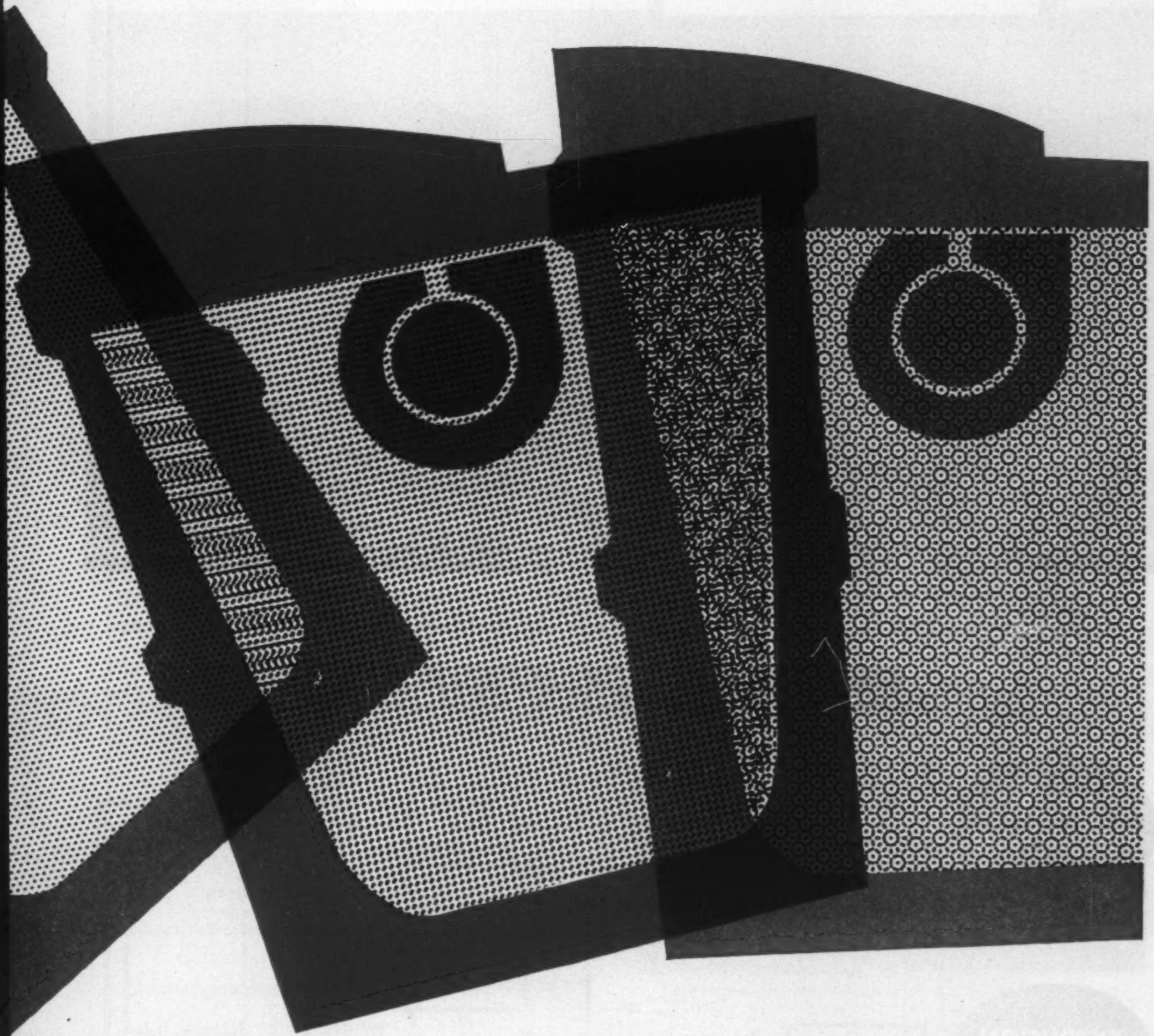

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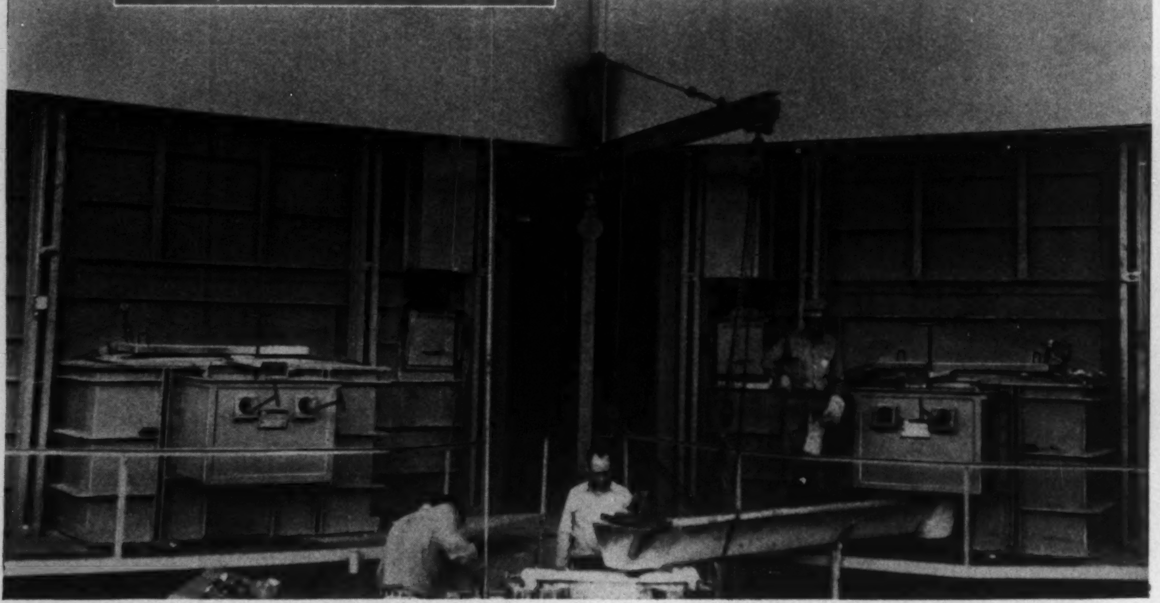

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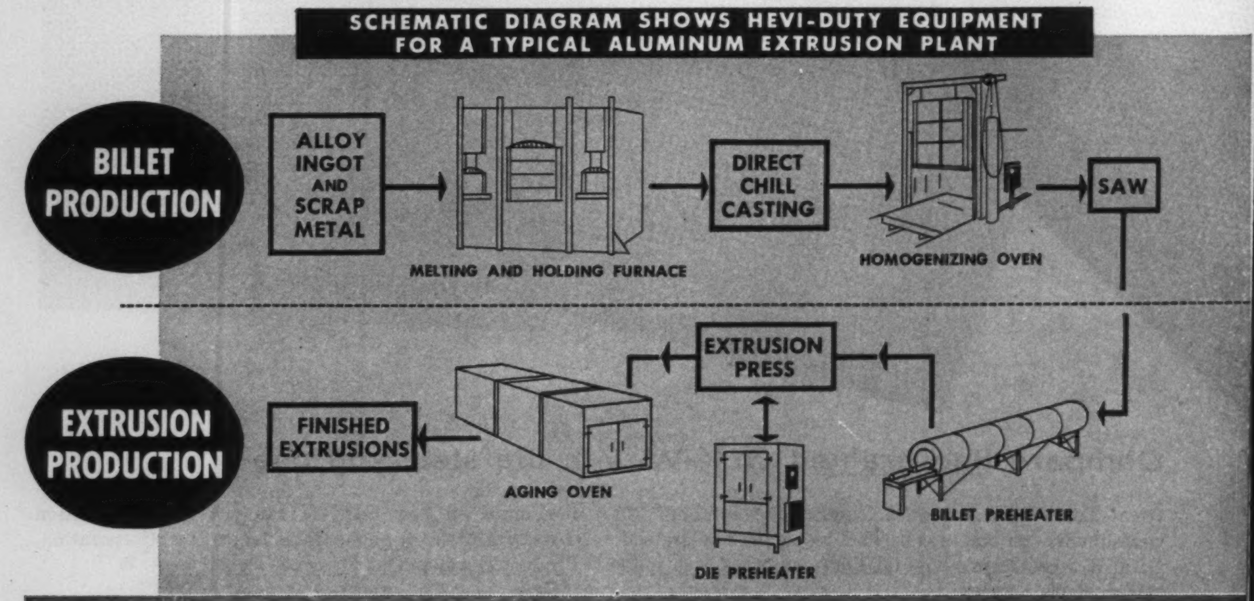
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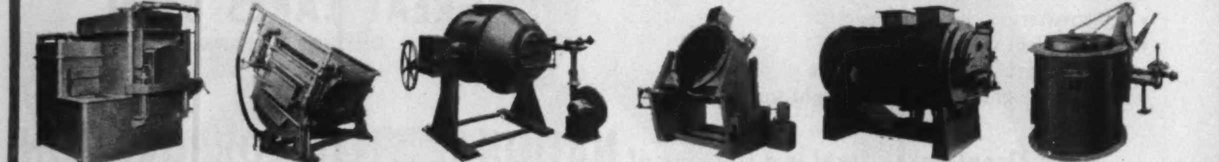

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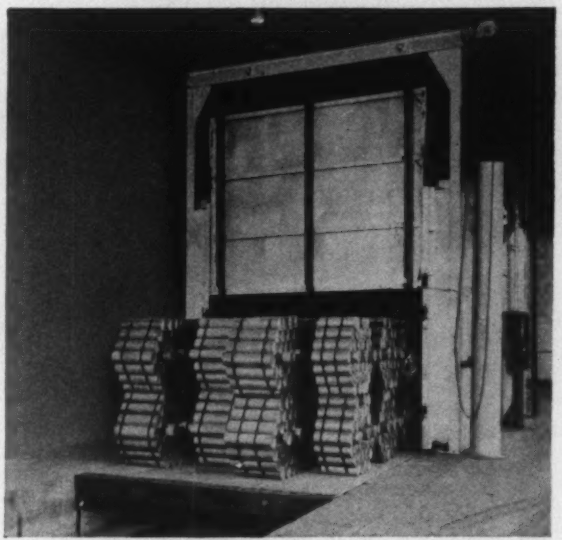

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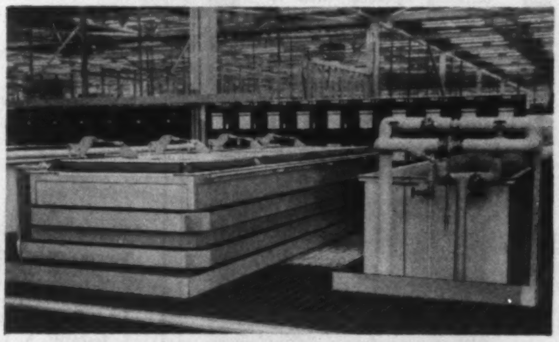

**SOLUTION TREATMENT AND AGING**—*Typical Hevi-Duty immersed electrode salt bath furnace used for solution heat-treating of large aluminum aircraft sections. Furnace illustrated has a pot 20 feet long, 4½ feet wide, and 6 feet deep.*

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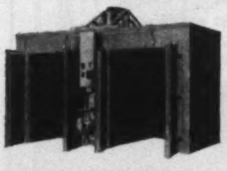
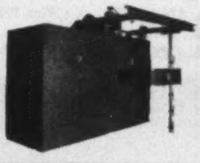
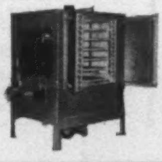
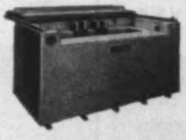
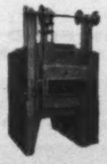
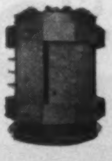

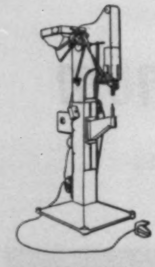
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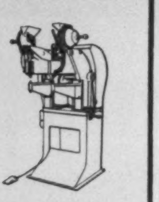
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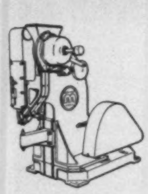
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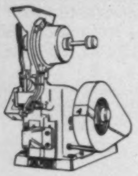
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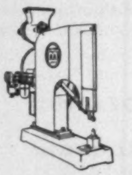
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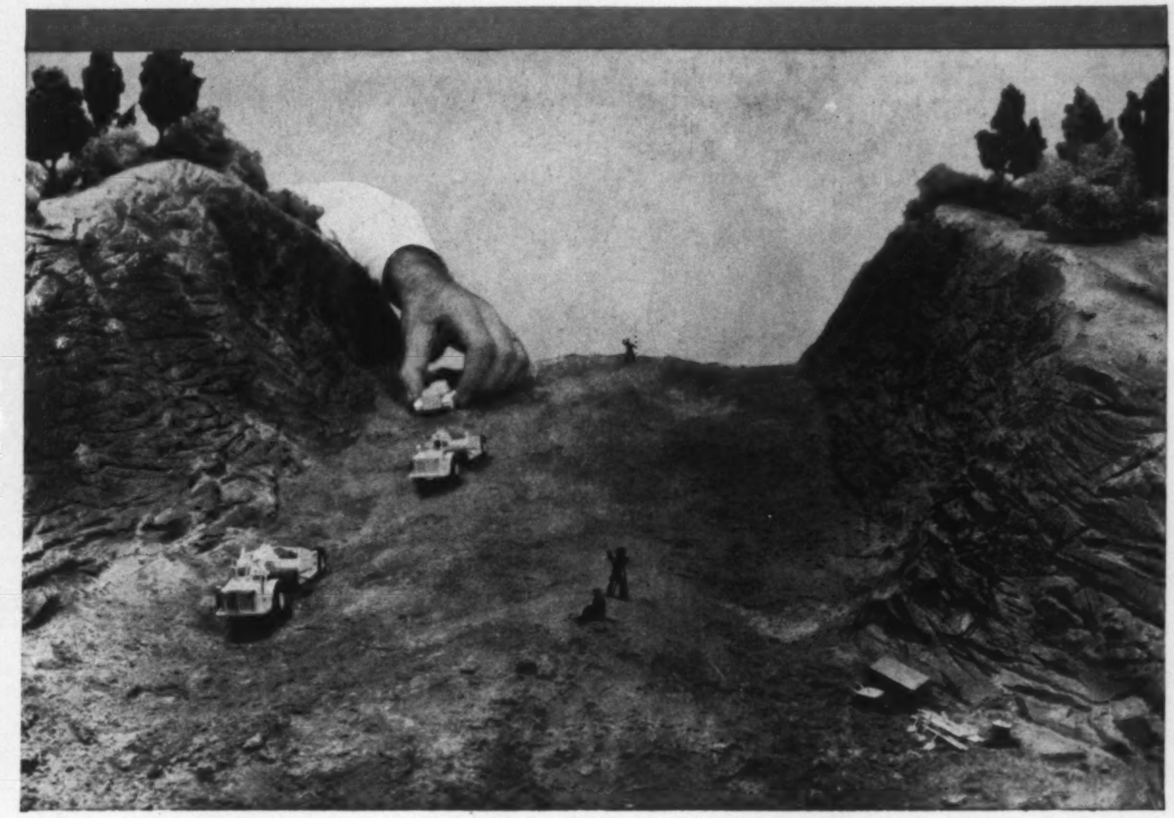

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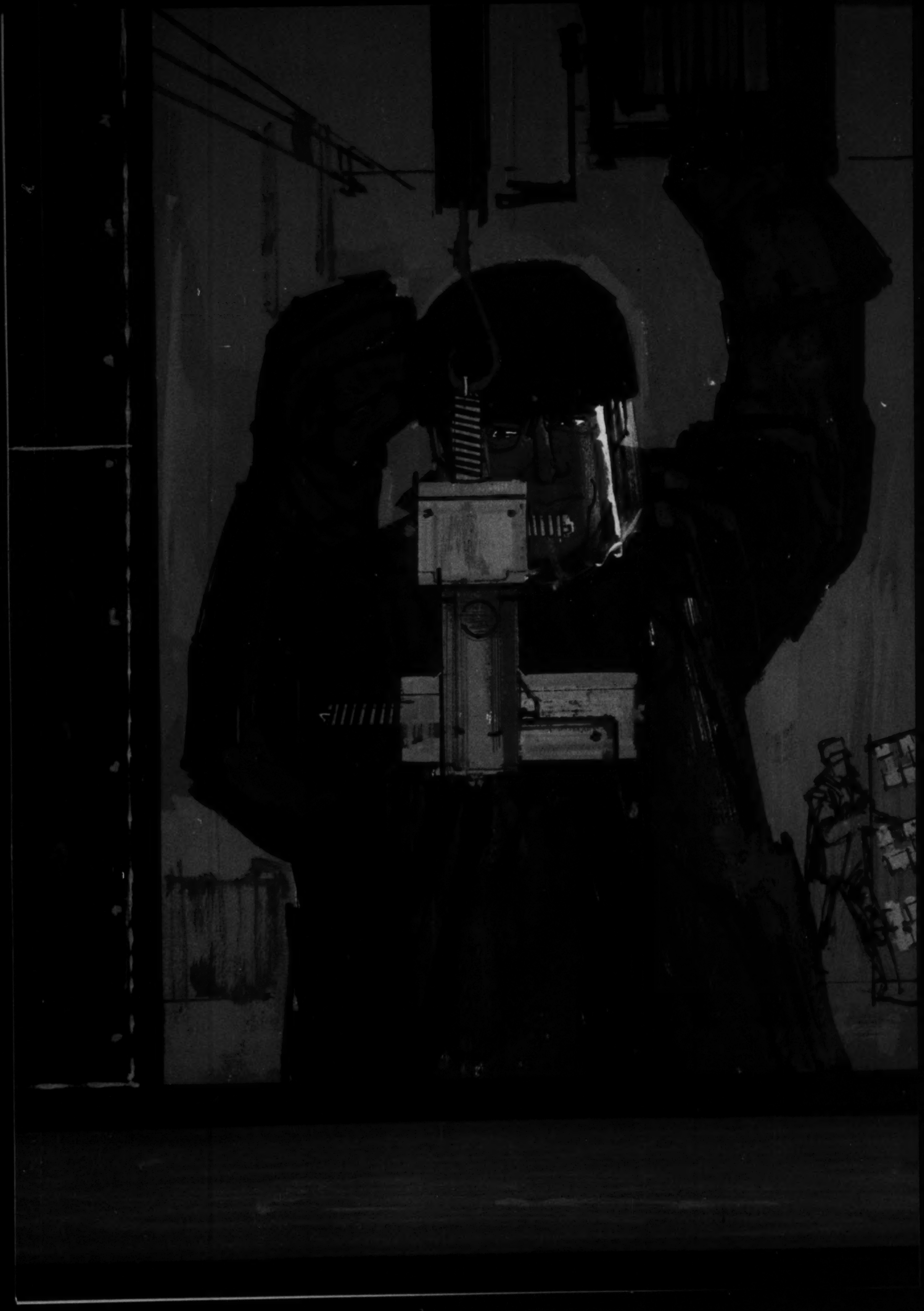

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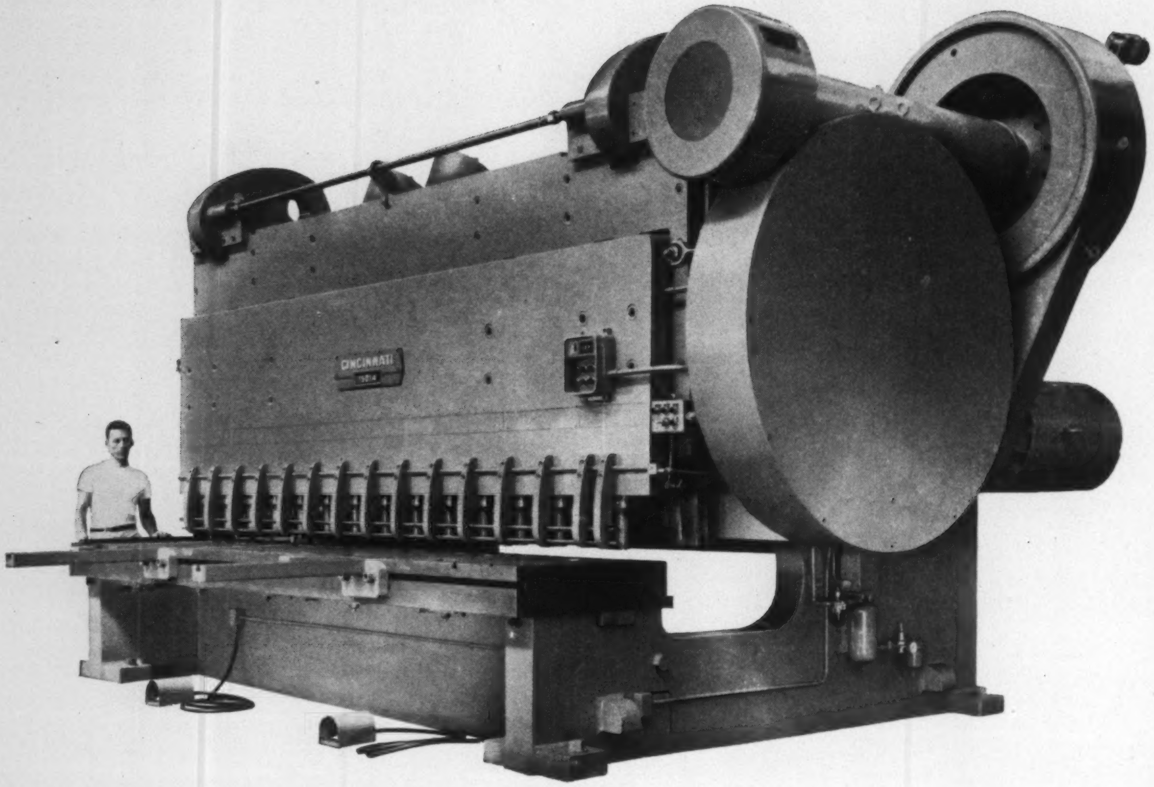

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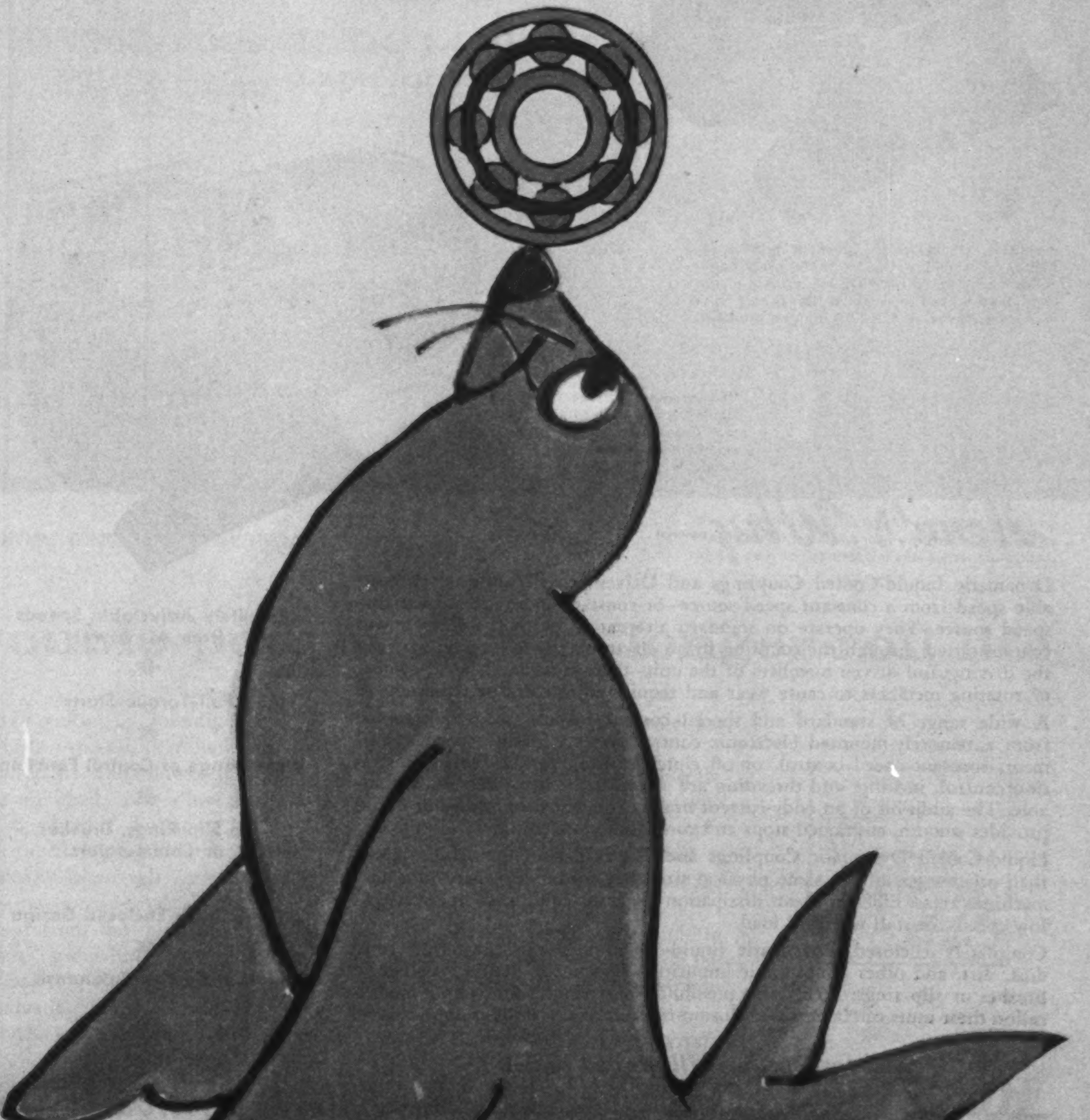

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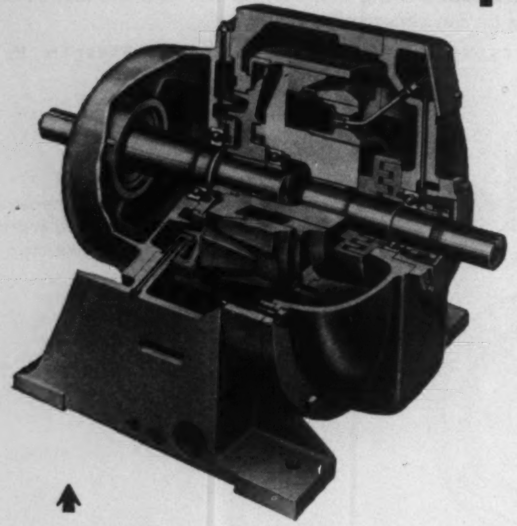

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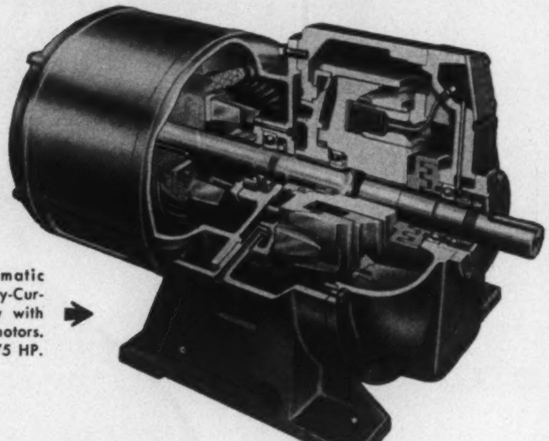

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*Send for Our New Illustrated Bulletin.*

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DYNAMATIC DIVISION
MANUFACTURING COMPANY
3307 FOURTEENTH AVENUE • KENOSHA, WISCONSIN

*Another example of National Roll quality control*

**"Easy" Esary, left, National sales representative and Larry Weaver, iron foundry supervisor, discuss a double-pour operation at National's Avonmore plant.**

# Double-pouring gives longer roll life

Double-pouring is a foundry technique in which a special, high hardness iron is poured first and allowed to form the outer roll shell; then a low alloy cast iron is poured, displacing the still-molten special composition iron to form a shock-resistant roll core and more easily machined necks.

Apart from the interesting, precise foundry procedures, double-poured National NN Nickel Iron Rolls have real advantages to roll users—high surface hardness needed for certain applications, plus a tough, resilient core that stands up in hard service.

National Roll's only business is rolls; steel, iron and nodular iron. That's why we have developed a team of metallurgy and production experts that is outstanding for its experience and the service it can render to roll users.

Much of the National story is told in a new brochure that soon will be off the press. Write for a copy. It helps explain why . . .

*National's the growing name in rolls*

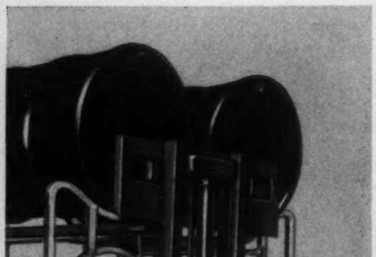
**NATIONAL ROLL & FOUNDRY DIVISION**

**GENERAL STEEL CASTINGS CORPORATION,** Avonmore (Westmoreland County), Pa.

**General Steel Castings Corporation, General Offices: Granite City, Illinois • Plants: Granite City, Ill., Eddystone, Pa., Avonmore, Pa.**

# STANDARD REPUBLIC MATERIALS HANDLING PRODUCTS SIMPLIFY CONTAINERIZATON

**REPUBLIC WEDGE-LOCK® PARTS STORAGE UNITS** are easy to load or unload from either side. And, the heavier the load, the tighter the grip, because patented Wedge-Lock construction includes a post that will not buckle; a concealed sway-proof joint, and a reinforced shelf that does not sag. Unlimited shelf arrangements. Capable of exceptionally high stacking. Republic Storage Engineering specialists will help you plan.



**NEW REPUBLIC DRUM RACKS** assure stacking of more in-use drums in less space and at lower cost than ever before. Each rack supports two loaded 55-gallon drums. Racks with drums can be stacked to any practical height. Standard fork-lift trucks can pick, move, and stack as many tiers of drums at one time as capacity permits. Shipped knocked down, with fasteners for quick and easy assembly.

**REPUBLIC PB-127 COLLAPSIBLE BOXES** lower the cost of storage or shipment of empty stacking boxes. Heavy-duty corrugated design delivers long, efficient service at lowest per-year cost. Boxes can be tiered when loaded or empty, collapsed or set up. All parts permanently attached. Ideally suited to shipping castings and other heavy items, the PB-127 Box offers up to 66% savings in storage space.

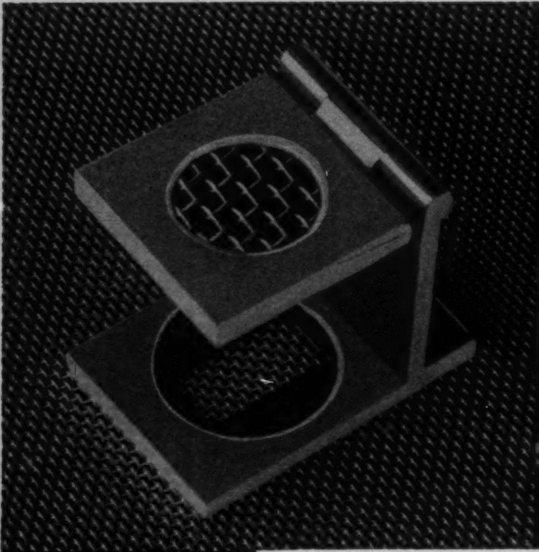
Moving raw materials through production lines to shipping is faster, easier, more economical, with standard Republic Materials Handling Units . . . key to *containerization.*

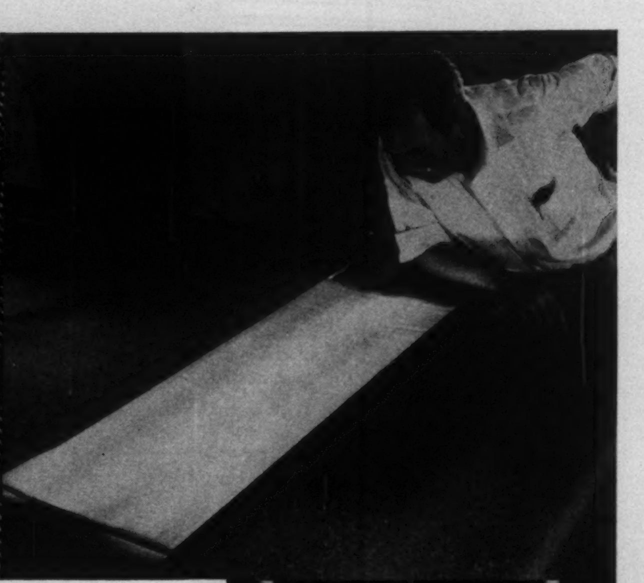
Strong, sturdy, Republic Units are designed and produced to withstand abuse of everyday, workday service. Many special materials handling problems can be solved from Republic's full line of standard units, at big savings for you.

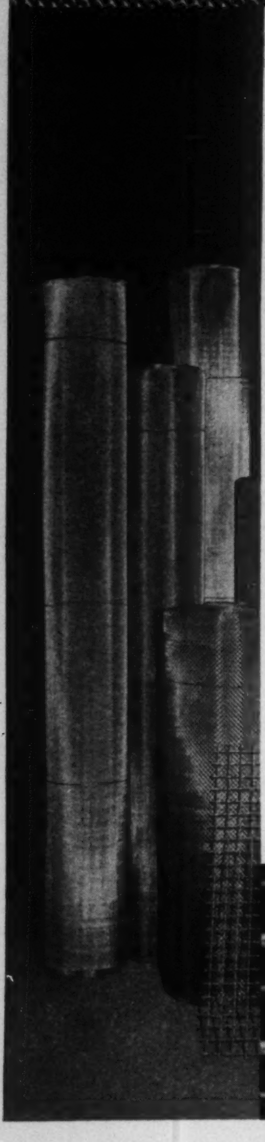
Let the materials handling engineers of Republic's Berger Division work with you in solving your materials handling problems. Call your Republic-Berger representative, or write direct.

**REPUBLIC STEEL**

**DEPT. ST -8877 • 1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO**







## Who counts 'em?

*CAMBRIDGE does . . .*

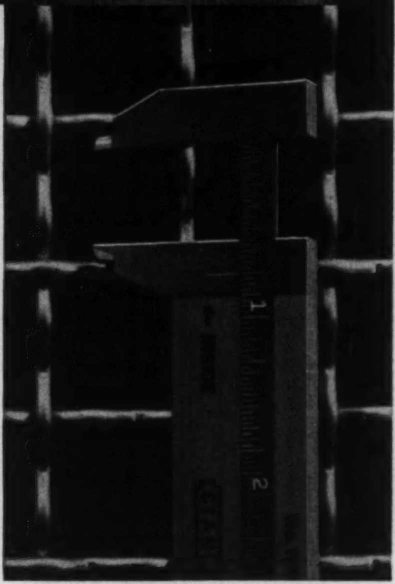
. . . because *exact* mesh count and mesh size are the trademarks of Cambridge INDUSTRIAL WIRE CLOTH.

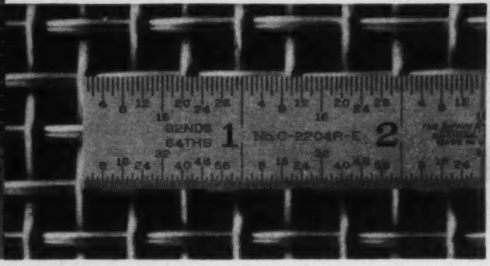
But, quality isn't the whole story. When you call Cambridge for industrial wire cloth, you also get service . . . prompt answers to your inquiries . . . quicker deliveries . . . and an experienced Field Representative who follows up your order to make sure our product is giving you the best possible service. Let us quote on your wire cloth needs. We manufacture wire cloth from any metal or alloy—including titanium—in nine basic weaves. Very likely, we have what you require in our warehouse right now. For samples or more information, call your Cambridge Field Engineer...he's listed in the yellow pages under "Wire Cloth". Or, write for FREE 94-PAGE CATALOG.

**The Cambridge Wire Cloth Co.**

Department J • Cambridge 2, Md.

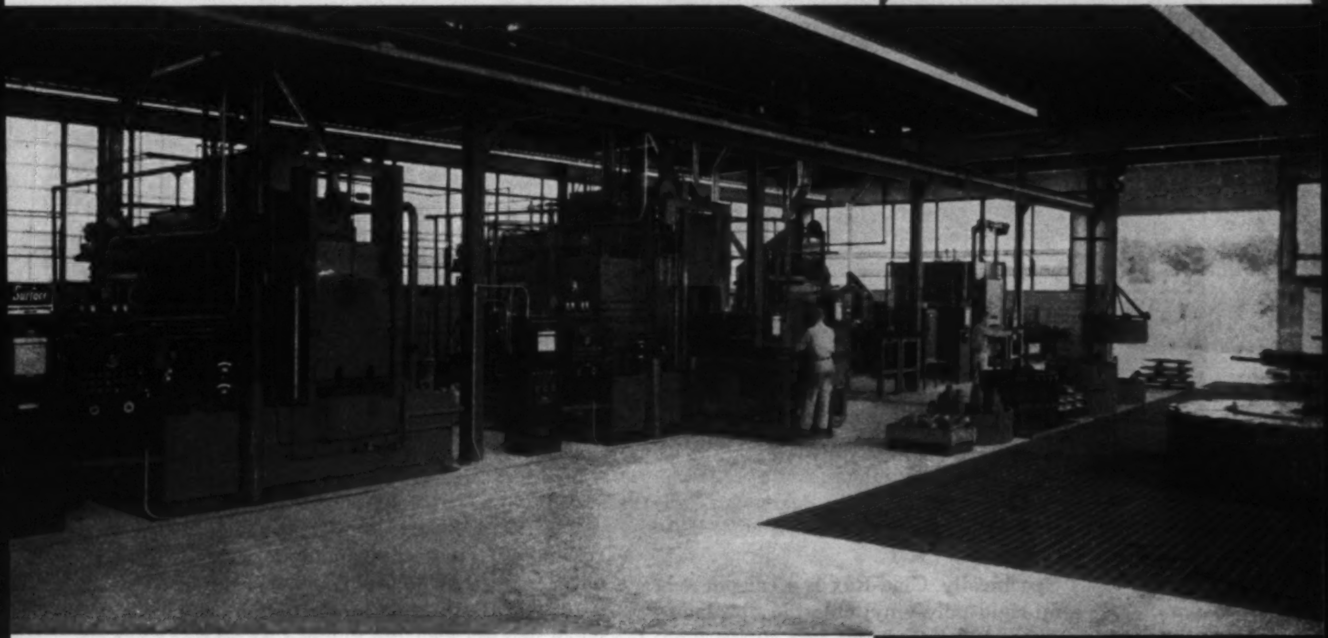
*Manufacturers of Wire Cloth, Metal-Mesh Conveyor Belts, Wire Cloth Fabrications*




32NDS
64THS
1
No.C-2P04R-E
2

Cambridge
WOVEN WIRE CLOTH, SCREENS AND WIRE CLOTH PRODUCTS
Cambridge
THE CAMBRIDGE WIRE CLOTH COMPANY, CAMBRIDGE MARYLAND

stop temperature variations
in high density loads with
SURFACE POWER CONVECTION



Exceptional uniformity and speed of heat treating, regardless of load density, help make a consistent profit-maker of this mechanized line of Surface batch-type furnaces at The Milwaukee Gear Company.

Because of Surface Power Convection, Milwaukee Gear has much greater metallurgical control and uniformity of product than ever before. High-velocity wind penetrates the tightest loads; assures uniform heat transfer whatever the size, shape, or alloy of the work.

Carburizing case depths are hit right on the button which vary from a few thousandths to 3/16 of an inch. This unusually flexible standard rated furnace line consists of two Super Allcase® furnaces, a horizontal draw furnace, spray washer, DX® and RX® gas generators, and Autocarb® signalling dewpoint controller.

Surface Power Convection cuts cycle times to a fraction.

These advantages only suggest the profitability of Surface Power Convection. Ask your Surface representative to describe the most important development in convection heat transfer in 20 years.

Write for Bulletin SC-182.

**SURFACE COMBUSTION** · 2385 Dorr Street, Toledo 1, O.
A DIVISION OF MIDLAND-ROSS CORPORATION

*In Canada: Surface Industrial Furnaces, Ltd., Toronto, Ontario*

Surface

*To the Executive Concerned with Rising Costs*
*and Competitive Pressures . . .*

# Are Clad-Rex® Vinyl-Metal Laminates too good to be true?

Almost, but not quite. Because Clad-Rex vinyl-metal laminates *are* real. And the way Clad-Rex substantially improves your manufacturing costs and product sales appeal is *just as real.*

Many other manufacturing executives are already proving the value of Clad-Rex in their operations. This is what they have learned . . .

Specifically, Clad-Rex is a calendered, semi-rigid poly-vinyl chloride film laminated to sheet metal. All alloys and tempers of aluminum and steel (including galvanized and aluminized) are commonly used. Other metals can be used where their special properties are important to end-product performance.

Incidentally, the words *calendered, semi-rigid, laminated,* etc., are very important. They're the characteristics that make Clad-Rex able to do what it *will do* for you, too.

Briefly—

Clad-Rex gives unlimited styling. Simulated woodgrains, leathers, as well as a wide variety of colors, patterns, and textures in sparkling burnishes including high metallics, or non-reflective mattes. You can even design your own, if you prefer!

Clad-Rex simplifies manufacturing operations. It's "finished" before you get it. Movement of sub-assemblies, etc., through your plant actually becomes more direct—out of your dies into assembly.

Clad-Rex lowers end product cost. Although Clad-Rex costs more coming into your plant, elimination of much expensive handling, finishing, and refinishing adds up to *less cost* by the time your product is ready to ship. Clad-Rex resistance to abrasion often eliminates the rejects common to *un*finished or some other prefinished metals. This includes the costly efforts to salvage rejects, of course.

That's it! Except for many other Clad-Rex advantages, such as the high dielectric strength, inherent resistance to corrosion, etc., that is common to calendered, semi-rigid poly-vinyl chloride film.

It's worth looking into. Particularly when you realize Clad-Rex can be fabricated in almost as many ways as any *un*finished sheet metal. *And,* your existing tooling can be used including forming dies in most cases. Clad-Rex even provides a Field Fabricating Engineer to show your production people how easy it is to get into production.

So, see for yourself. Write and ask for details on Clad-Rex. No obligation, of course.

VINYL-METAL LAMINATES BY **CLAD-REX** DIVISION OF SIMONIZ COMPANY

**2105 Indiana Avenue • Chicago 16, Illinois**
**Telephone: VIctory 2-7272**

THE NEW BRITAIN MACHINE CO.

# precision boring–*New Britain's new approach*

New Britain Cam Actuated Vertical Precision Boring Machines offer an entirely new principle for more accurate boring and turning, plus compact exterior design and fast tooling. Rough cuts and finish cuts within close tolerances on the same set-up are characteristic. Standard models are available with maximum swing from 12″ to 17¾″ in 10 or 15 horsepower.

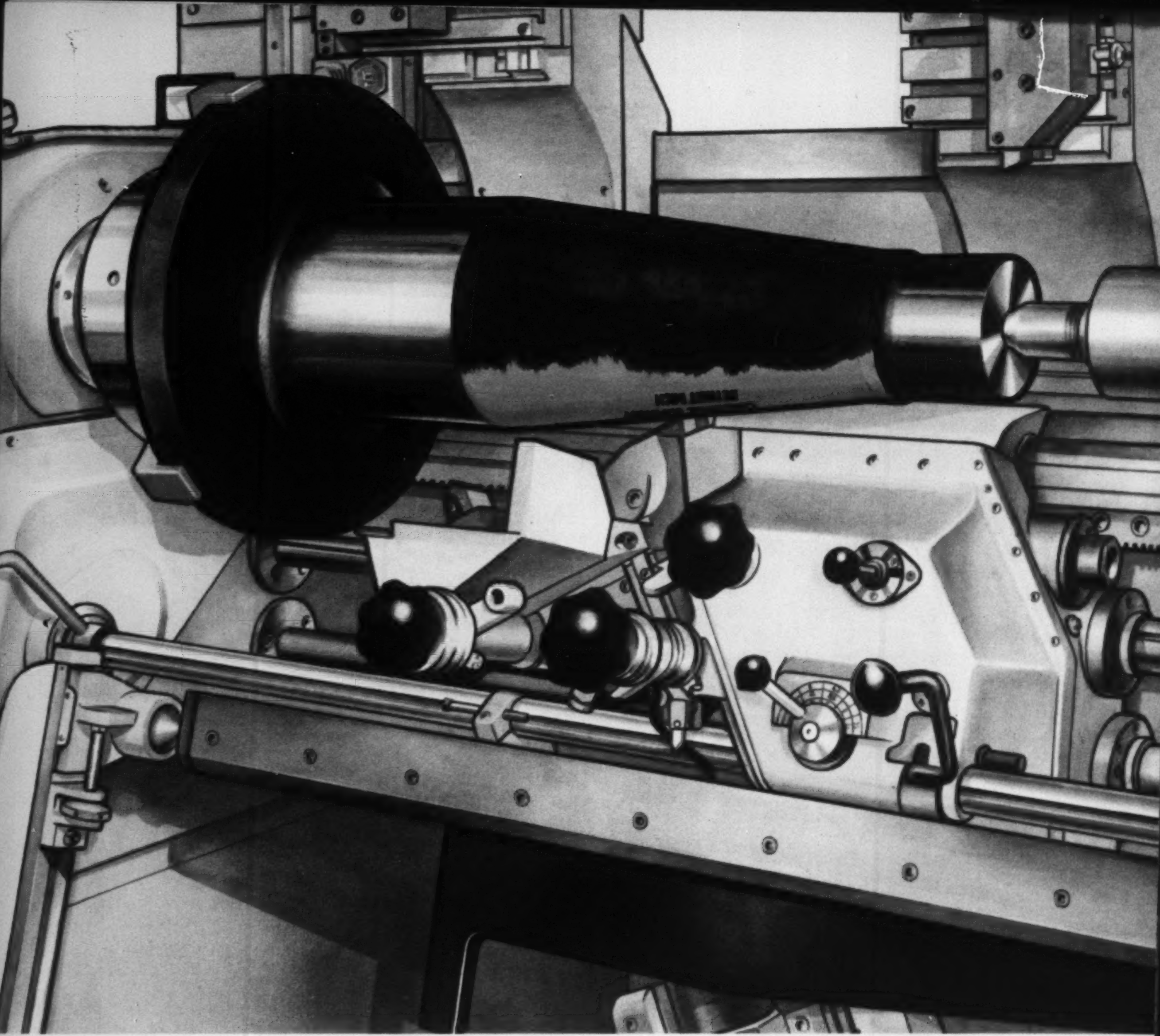
Here are a few of the major new developments incorporated in these unusual machines.

**Greater accuracy.** Both the vertical and cross slide cams are mounted on a common shaft which is contained inside the vertical slide. The linkages found in conventional cam-operated contouring machines are eliminated. Both the vertical and cross slides ride on preloaded roller bearings and are deflection-free.

**Clean-sided design.** Any number of these self-contained machines, each with one or more spindles, can be arranged side by side. Depending on how they are tooled, they operate either as a single unit or as individual machines. Parts can be inverted on adjacent machines or on adjacent spindles of the same machine, finishing both sides, completing *all* operations in one integrated, high-volume operation.

**Fast tooling.** Unrestricted accessibility allows rapid tool and cam changes.

Complete catalog material is available. For your copy, write New Britain-Gridley Machine Division, The New Britain Machine Company, New Britain, Connecticut.



# *why a* **copying lathe**–*why New Britain* **+GF+**

Beyond a certain point sustained production of the same piece on an engine lathe becomes uneconomical. Sometimes, however, the feeling exists that a copying lathe lacks flexibility, power and ruggedness or that it is just too "special." A New Britain **+GF+** has power—25 to 40 h.p. The **+GF+** has rugged design to handle big work and it's really flexible—a prototype or flat template will reproduce one or more pieces with fast, single point tooling. Whether it's shaft work or chucking work you have to do, ease of set-up is the same. The template or prototype can be changed in minutes. No special tooling set-ups are required, either. You can quickly switch from intricate cuts on slender shafts to heavy cuts on big castings or forgings (like the one shown). Complex profiling presents no problems even on jobs requiring really heavy metal removal.

Fast set-up and changeover from one type of work to another is only part of the story. There's much more that you'll want to know about the New Britain **+GF+**. Watching one of these machines in action is the best way to get the whole story and we'd like to arrange a demonstration for you. If you'd like to look over catalog material, we have that too, of course. Write New Britain-Gridley Machine Division, The New Britain Machine Company, New Britain, Connecticut.

*The Prime Mover Company, manufacturer of materials handling equipment, says:*

# Our "Prime Movers" give these 6 parts a terrific beating...that's why they're made of LaSalle

**STRESSPROOF®**
STEEL BARS

Engineers of the Prime Mover Company, Muscatine, Iowa, demanded the most dependable steel bars available for six important parts of their transmission assembly. Here are some of the reasons they specified STRESSPROOF!

You don't have to heat treat STRESSPROOF! There's no heat treat distortion.

STRESSPROOF is strong . . . 100,000 psi.

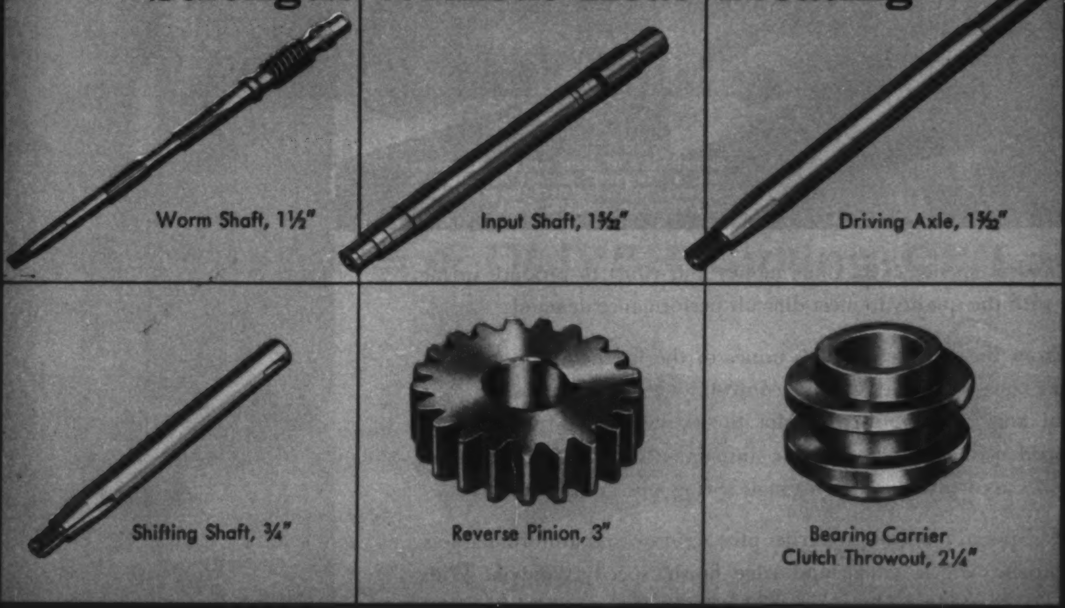
It machines faster . . . at 83% the speed of B1112.

It wears better without case hardening . . . replacing .40 carbon alloy steels and other heat treated and alloy steels, such as 8640, 4140, C1045, C1141, and C1137.

It costs less than heat treated in-the-bar alloys.

**with copper**

## Strength Without Heat Treating



*Use this coupon to request technical bulletin announcing improvements in LaSalle STRESSPROOF Steel Bars...with copper.*

**La Salle STEEL CO.**

1414 150th Street
Hammond, Indiana

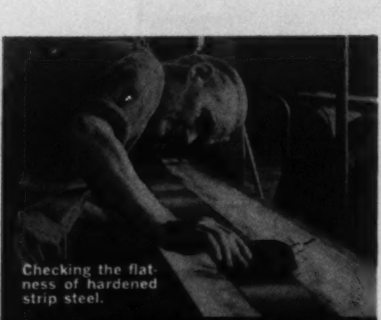
Please send technical bulletin "Today's Improved LaSalle STRESSPROOF Steel Bars...with Copper."

Name________________
Title________________
Company________________
Address________________
City________________Zone______State________________

# Careful And Costly Control Grooms

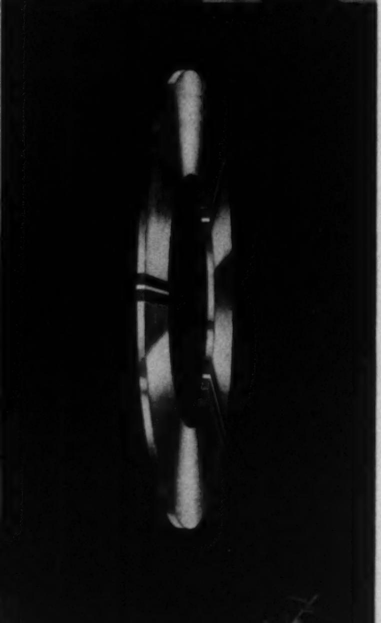
# SANDVIK SPRING STEELS

# *FOR SPECIAL PERFORMANCE*



Checking the flatness of hardened strip steel.

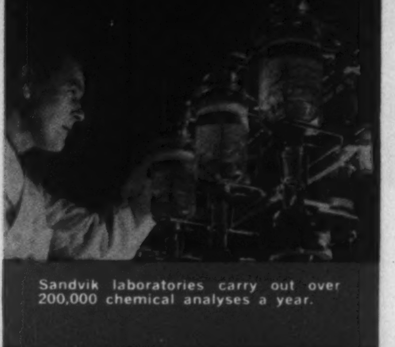
Smoothness of strip surface is checked with a "Talysurf" surface measuring instrument which registers the profile depth magnified up to 50,000 times.



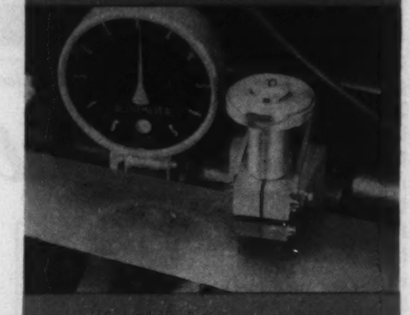
Sandvik spends extra time, money and effort to produce spring steels with the quality to meet difficult performance demands.

From the ore in Sandvik's mines to the finished strip, Sandvik applies constant, rigid quality control to every steel-making step. Special analyses, careful, small-lot processing, modern laboratories equipped with special scientific instruments . . . these are behind Sandvik's record of success in tough spring steel applications.

For special physical properties plus accurate and uniform flatness, straightness, width, gauge and edge finish, specify Sandvik. Wide variety of qualities and sizes in stock plus local Sandvik facilities for custom-processing and finishing to your requirements. Send for free brochure.



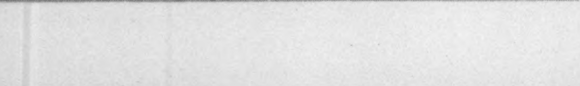
Sandvik laboratories carry out over 200,000 chemical analyses a year.



Strip thickness is checked during rolling and at final inspection with a "Deltameter"

## SANDVIK STEEL, INC.

**1702 Nevins Road, Fair Lawn, N. J.**
**Tel. SWarthmore 7-6200 • In N. Y. C. ALgonquin 5-2200**
***Branch Offices:* Cleveland • Detroit • Chicago • Los Angeles**
**SANDVIK CANADIAN LTD. P.O. Drawer 1335, Sta. O. Montreal 9, P. Q.**
***Works:* Sandviken, Sweden**



SS-205

## PARTS BY THE THOUSANDS . . .

*Left to right: Plastic tubing, rings and formed spacers, coupling blanks, heavy pipe nipple blanks, standard pipe nipple blanks.*

# Formed . . . Chamfered . . . Cut-Off on BARDONS & OLIVER Cutting-Off Lathes

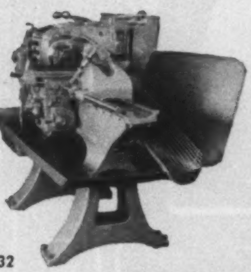
**Superior Pipe Specialties Co., Chicago,** reports a *ten year* profit success using Bardons & Oliver Cutting-Off Lathes.

The firm produces parts for their hydraulic equipment plus a wide variety of products on a jobbing basis.

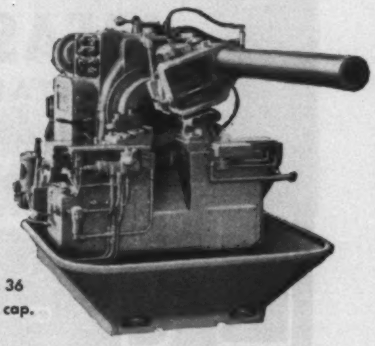
Says Mr. Youhn, Factory Superintendent: "Bardons & Oliver Cutting-Off Lathes are the *only* machines of this type that will stand up under years of hard use. We are completely satisfied with them in every respect."

As the above photograph suggests, "versatility" is the name for these Bardons & Olivers. They're unexcelled for forming, chamfering and cutting-off tubular or solid bar stock. You realize extra profits by using these outstandingly rugged machines in your plant. Available in collet capacities from 2 to 16 inches, with automatic loading and unloading equipment if desired.

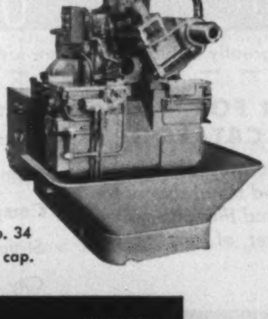
Bardons & Oliver, Inc., 1147 West 9th Street,
Cleveland 13, Ohio.



No. 32
2" cap.



No. 36
6⅝" cap.



No. 34
4" cap.

### OPERATING DATA FROM SUPERIOR

Typical hourly production
- No. 32 — 4000 - ½" pipe nipples chamfered & cut-off.
- No. 34 — 1082 - 2" pipe nipples chamfered & cut-off.
- No. 36 — 240 - 5" pipe nipples chamfered & cut-off.

Tolerances held on lengths: ±.002"

Average set-up time: 20 minutes

Tooling

High speed steel, carbide or roller cutter, depending on finish desired, material, operations performed and lot size.

Operators Required

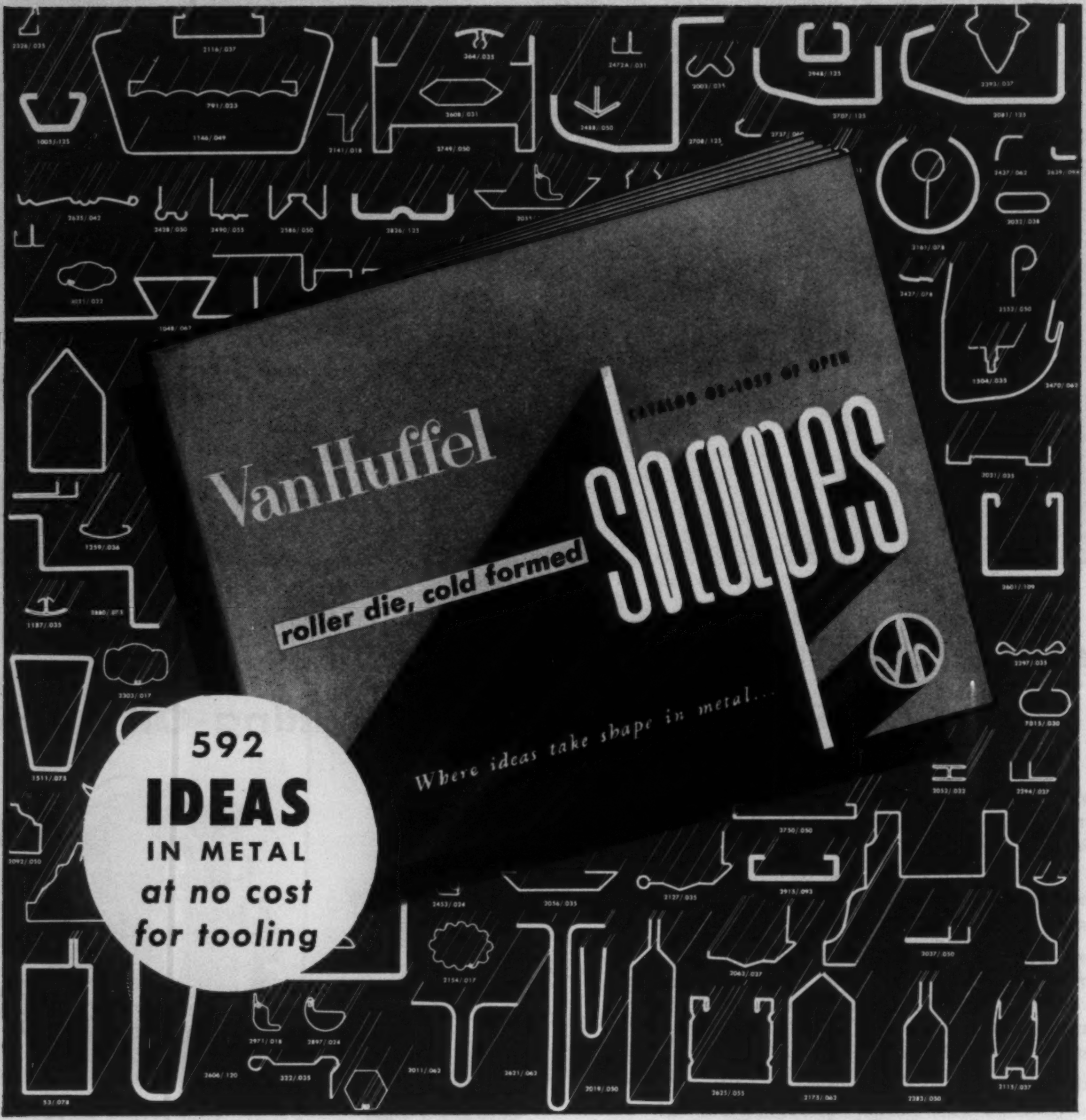
2 men operate 3 machines, including setup, loading, and unloading (With automatic handling equipment 1 man can run 3 machines).

**BARDONS & OLIVER**

Manufacturers of Turret Lathes and Cutting-Off Lathes

BOOK

# SHAPE ^ OF THE MONTH


592
IDEAS
IN METAL
at no cost
for tooling
Van Huffel
CATALOG OS-1059 OF OPEN
roller die, cold formed
shapes
Where ideas take shape in metal...

*Illustrated, greatly reduced, are a few ideas that have taken shape in metal.*

## MAIL THE COUPON FOR FREE OPEN SHAPE CATALOG

*48 page catalog OS-1059 illustrates (actual size) over 500 roller die, cold formed metal shapes for which rolls and dies are on hand thus eliminating tooling costs to the purchaser of any of the shapes illustrated.*

**Van Huffel Tube Corporation, Warren, Ohio**

*Please rush me Open Shape Catalog No. OS-1059.*

Name .............................. Title ..............

Company..................................................

Street Address ..........................................

City ........................ Zone .. State .............

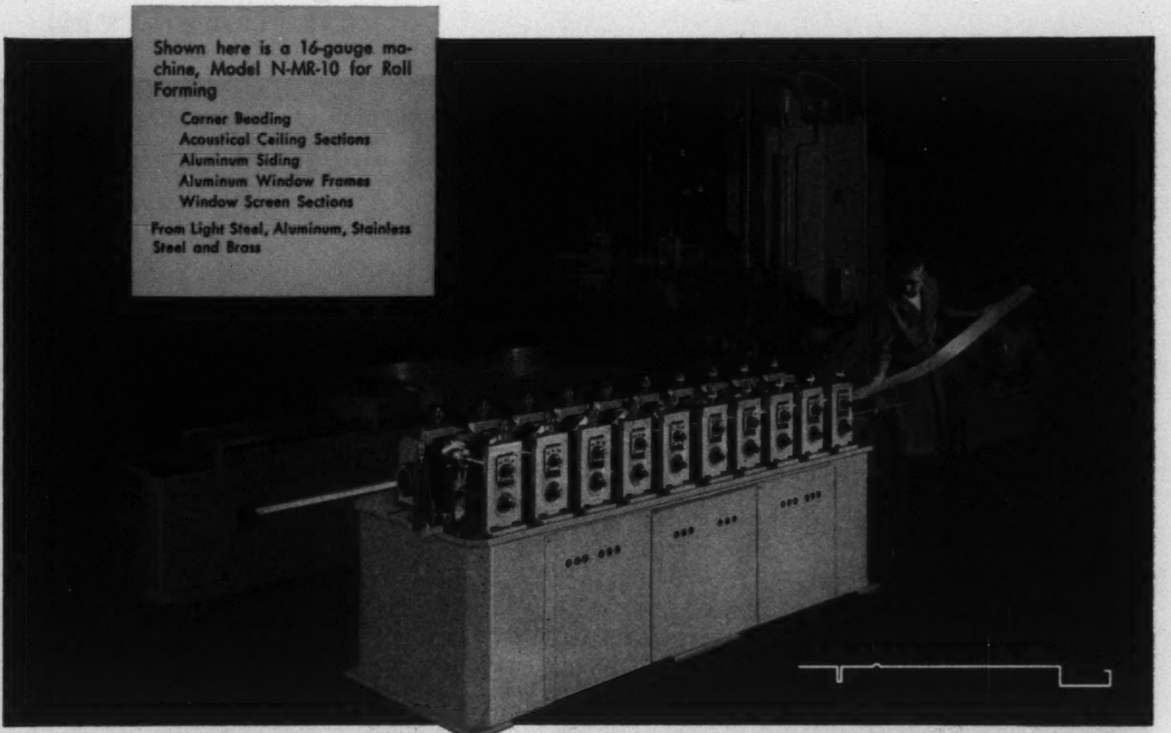
**VAN HUFFEL** TUBE CORPORATION • WARREN, OHIO

For A Better Method of Forming Metal Up To 12 Gauge*...

## DO IT FASTER, WITH LESS HANDLING, MORE OPERATIONS IN A SINGLE PASS!

with

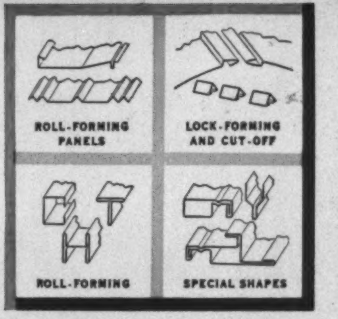
## MAPLEWOOD ROLL FORMING MACHINES



Shown here is a 16-gauge machine, Model N-MR-10 for Roll Forming

- Corner Beading
- Acoustical Ceiling Sections
- Aluminum Siding
- Aluminum Window Frames
- Window Screen Sections

From Light Steel, Aluminum, Stainless Steel and Brass



**MAPLEWOOD GIVES YOU THESE BONUS FEATURES:**

Variable Speed Drive with forming speed up to 200 fpm.

Adjustable Roll Center Distance from 4" to 5".

Sheet Metal Capacity Up To 72" wide.

See *Maplewood Engineers* for High-Speed Low-Cost Roll Forming Methods on Your Metal Sections.

**Heavier Gauges Quoted On Request*

**MAPLEWOOD**

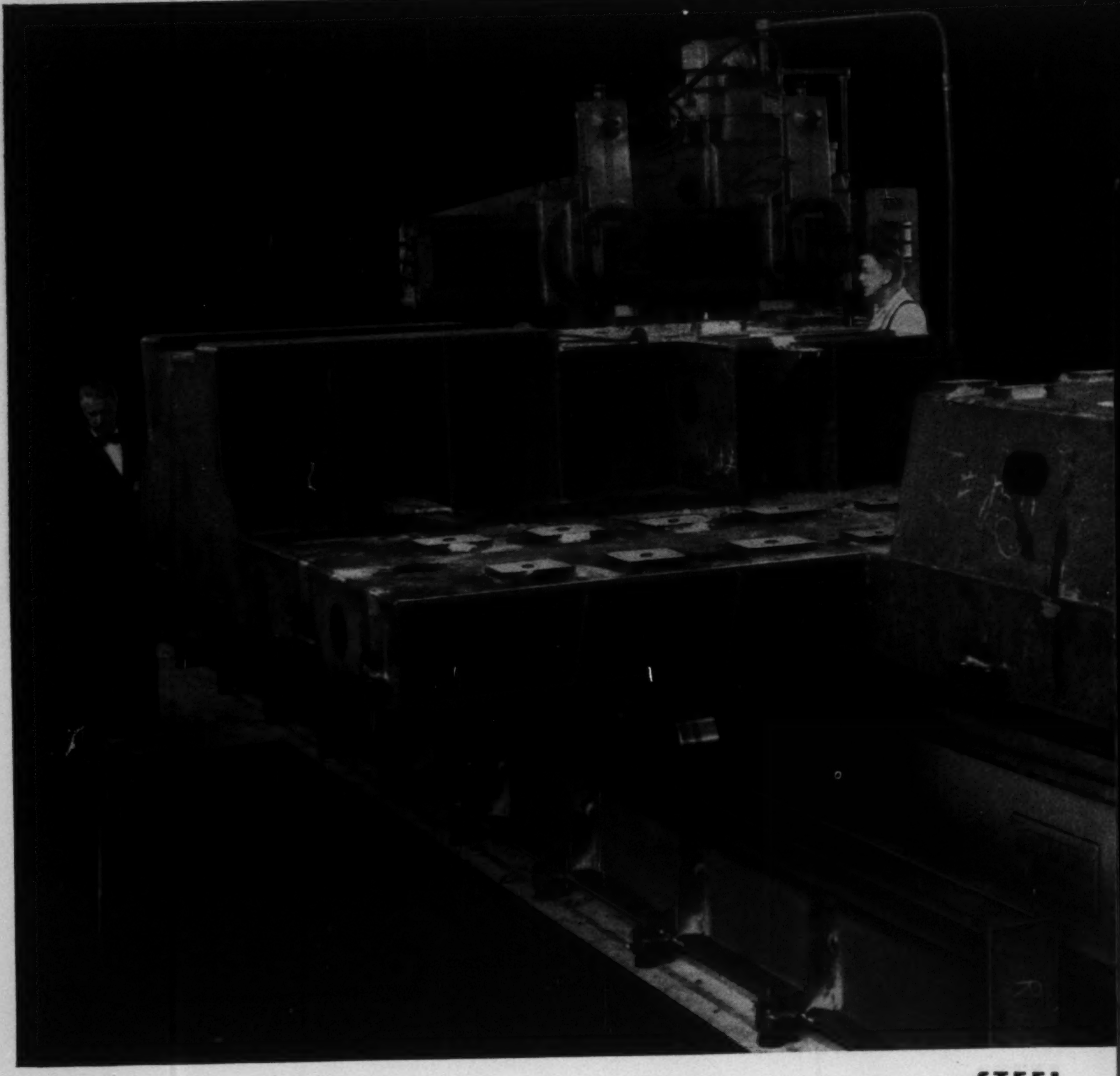
**RMT**

ROLL FORMING MACHINES

DIVISION OF ROCKFORD MACHINE TOOL CO.
2500 KISHWAUKEE STREET ROCKFORD, ILL.

COMPLETE LINE OF ROLL FORMING, CUT-OFF MACHINERY

# Nothing does the job like a..



**ROCKFORD**
**h**
**HYDRAULIC**

# PLANER

POTTSTOWN MACHINE COMPANY
MACHINES MORE WORK, AT LESS COST,
THROUGH WIDE SET-UP FLEXIBILITY

SAVES 33% HOURLY COST, 15% TOTAL PRODUCTION TIME ON THIS JOB.

Operation: Using auxiliary rail, planes top and bottom pads on Paper Mill Drive base, 10' 2½" wide x 18' 3¾" long x 3' 5¾" high, weighing 8½ tons.
TOP: 26 pads, 6 different elevations; total area 2806 sq. in.
BOTTOM: 16 pads, one plane
total area 3168 sq. in.
largest pad, 12" x 54"
smallest pad, 4" x 9"

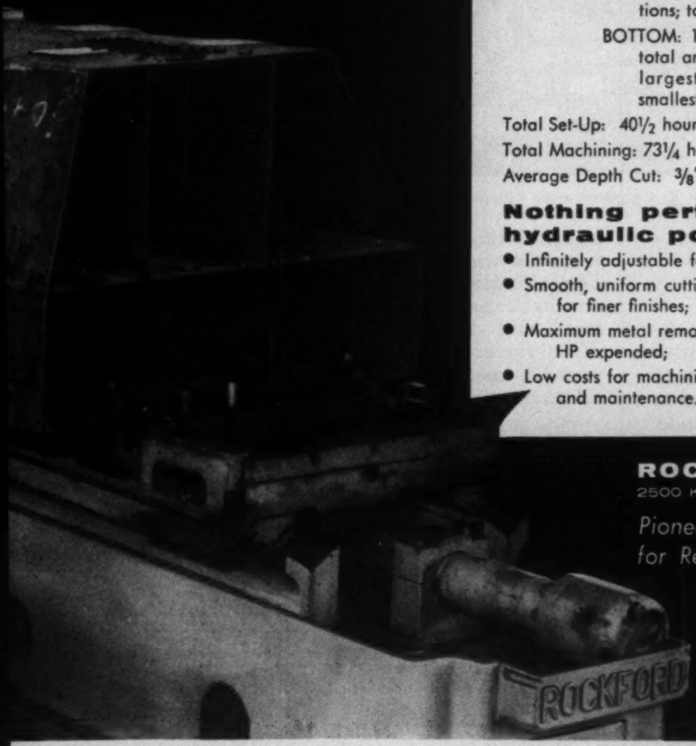
Total Set-Up: 40½ hours
Total Machining: 73¼ hours
Average Depth Cut: ⅜"

**Nothing performs like hydraulic power:**

- Infinitely adjustable feeds and speeds;
- Smooth, uniform cutting pressures for finer finishes;
- Maximum metal removal per HP expended;
- Low costs for machining, cutting tools and maintenance.

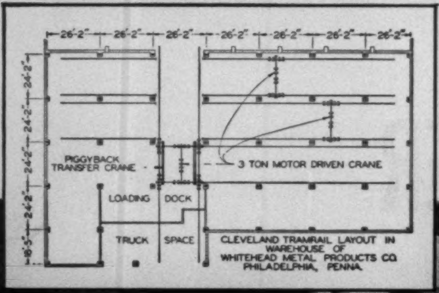
**ROCKFORD MACHINE TOOL CO.**
2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS

*Pioneers In The Use of Hydraulic Power for Reciprocating Machine Tools*



# PIGGYBACK CRANE Solves Warehouse Handling Problem

## *Carries Load-Handling Cranes Between Building Columns*



**Piggyback crane carrying a single-girder crane, which in turn is transporting a case of aluminum sheets with sheet grab. All cranes are 3 ton capacity and motorized. They are easily operated by one man.**

**Piggyback crane with loaded single-girder crane over truck at loading dock.**

THE many regularly spaced building columns in the warehouse of Whitehead Metals, Inc., Philadelphia, posed a tricky problem for the economical handling of flat cases of sheet metal and rectangular crates of pipe and tube, and the multitude of odd shaped cases carried by this metal distributor.

Overhead materials handling equipment was desired because of inherent advantages; such as, enabling maximum use of floor area for storage, higher piling, elimination of serious truck damage to floors and low cost of maintaining overhead equipment. It was also desired that the handling equipment provide complete floor coverage and be as efficient an arrangement as possible.

Cleveland Tramrail engineers solved the problem by designing a special double-girder piggyback transfer crane. This operates on a runway that extends the width of the building and over the loading dock. Single-girder cranes on right-angle runways can be transferred with their loads onto the piggyback and carried to any right-angle runway or directly over a truck at the loading dock. This makes possible fast, easy conveyance of materials between all points covered by the Tramrail system.

This is only one of thousands of unusual handling problems solved by Cleveland Tramrail engineers. No matter how simple or complex your problem is, we recommend that you call Cleveland Tramrail early in your planning.

*Write for free booklet No. 2008*

**CLEVELAND TRAMRAIL**

**Overhead Materials Handling Equipment**

**CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 7855 E. 290 ST. • WICKLIFFE, OHIO**

## NOW HE KNOWS WHY

# lubrication is a management responsibility

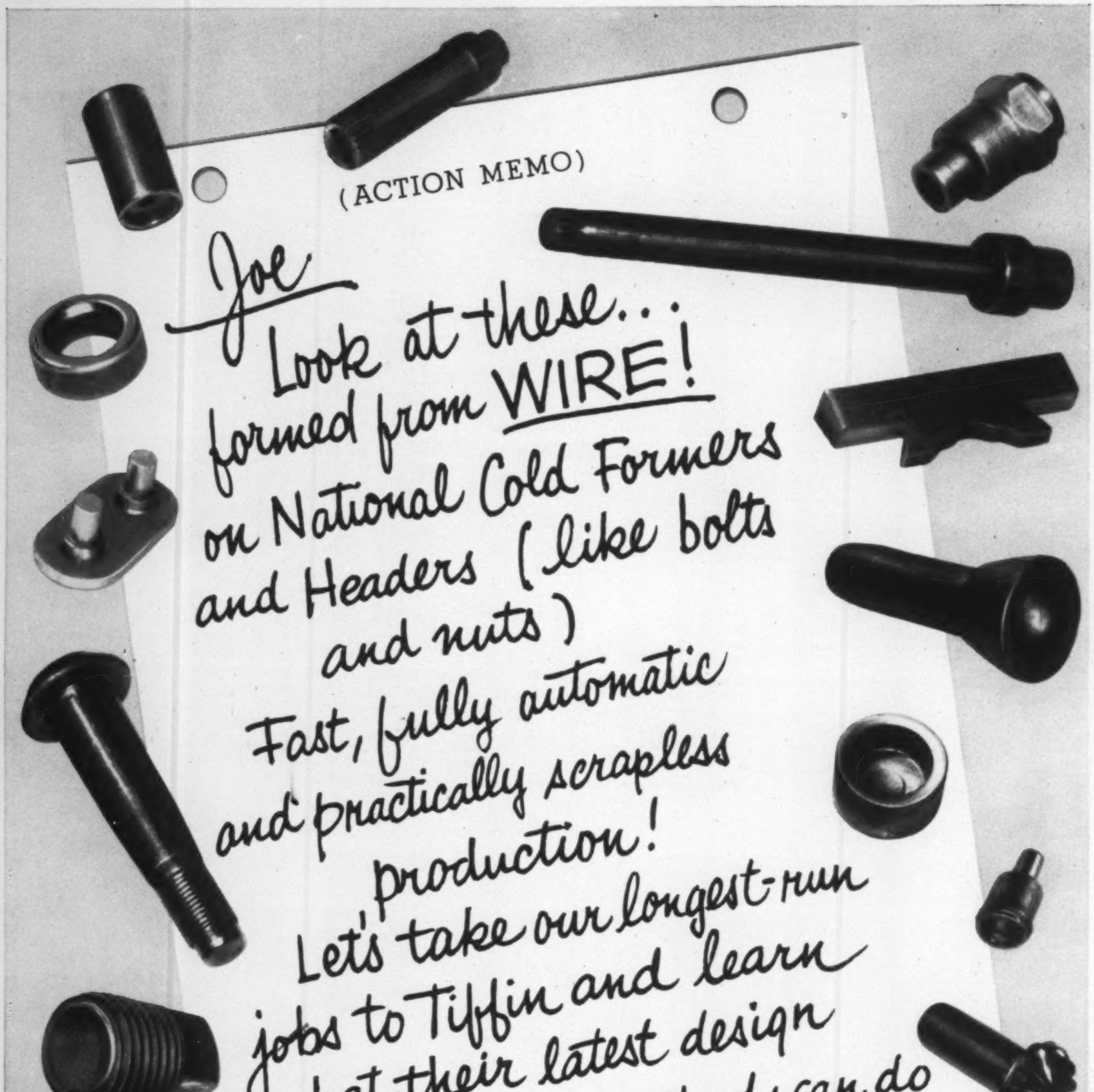
MANAGEMENT *does* have a stake in good lubrication practices.

If you recognize lubrication for what it is — a cost-reducing tool, not an expense item — you can effect savings that add up to many hundred times the cost of the lubricants themselves. Yet only management has the authority to make these potential savings an actuality. That's why lubrication is your responsibility. **Texaco can help you achieve these savings.** Texaco Lubrication Engineers have had valuable experience in tailoring Organized Lubrication Programs to the needs of virtually every industry. They can help show *you* the way to important savings. Why not talk to your nearest Texaco Lubrication Engineer today — or write for our new Book "Organized Lubrication — Major Cost Control Factor."

Texaco Inc., 135 East 42nd Street, New York 17, New York. Dept. S-140

Organized Lubrication
TEXACO

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

<br>
(ACTION MEMO)

Joe

Look at these...
formed from WIRE!
on National Cold Formers
and Headers (like bolts
and nuts)
Fast, fully automatic
and practically scrapless
production!
Let's take our longest-run
jobs to Tiffin and learn
what their latest design
machines and methods can do
for us! OK? Bill

*Founded 1874—DESIGNERS and BUILDERS of MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS CO-PIONEERS WITH INDUSTRY OF ADVANCED METALWORKING PRODUCTION METHODS*

**NATIONAL MACHINERY CO.**

*TIFFIN, OHIO, U. S. A.*

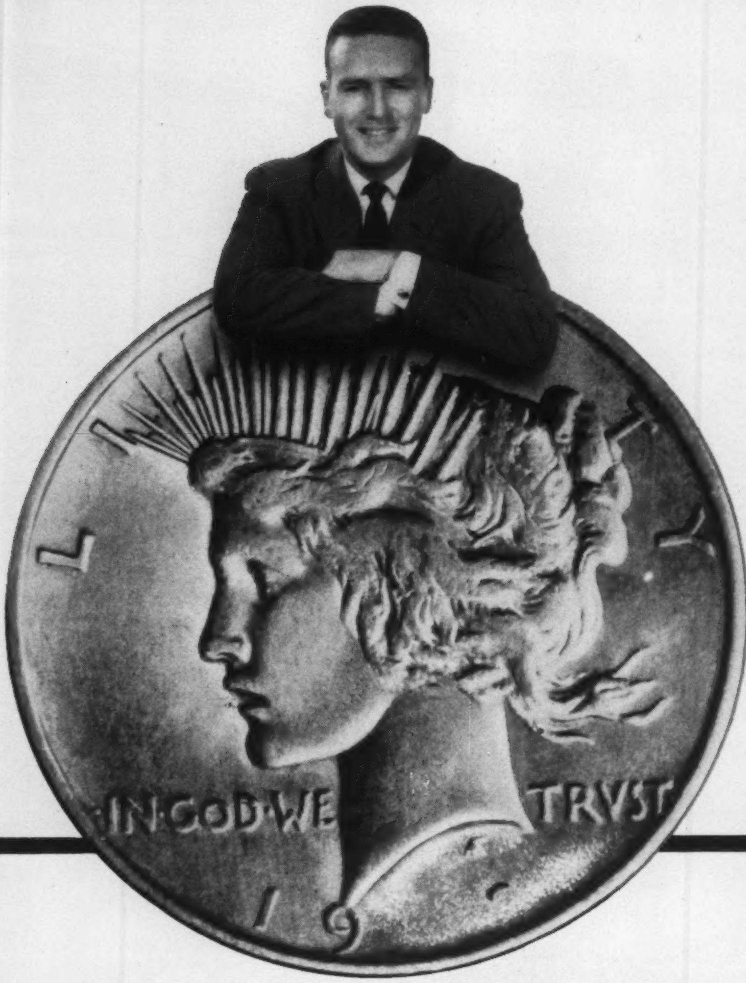
HARTFORD DETROIT CHICAGO

## have you seen all that's new in gleaming stainless steel?

Now, leading department stores everywhere are showing gleaming, carefree Stainless Steel in new and exciting displays. See these shining examples of Stainless Steel kitchenware, tableware, utensils and appliances to make your living easier. *McLouth Steel Corporation, Detroit 17, Michigan*

**McLOUTH STAINLESS STEEL**

# Your most productive dollars can be life insurance dollars!



The dollars you invest in Business Life Insurance are *working dollars*. They can *make* money for you and they can *save* money for you.

An Ætna Life plan can increase the value of your business estate by protecting against the shrinkage due to estate taxes and transfer expense, for example. It can provide working capital when you need it most. It is the most *economical* way to guarantee continuity and management stability of your business if there is a death in the ownership. It can attract and hold good men.

Ætna Life's exclusive Business Planning Service will make sure your Business Life Insurance dollars are working to capacity for you. These experts, working through your attorney, will help you establish a plan or review your present arrangements. Your Ætna Life office makes their services available without cost or obligation.

## Ætna Life Business Insurance plans work for you!

- **Improve credit**
- **Strengthen personnel relations**
- **Attract desirable employees**
- **Give you a source of emergency capital**
- **Assure liquidity**
- **Offer you income and estate tax advantages**
- **Protect your firm *and* your family if death occurs**

ÆTNA LIFE
INSURANCE COMPANY
**Hartford 15, Connecticut**
**Affiliates: Ætna Casualty and Surety Company**
**Standard Fire Insurance Company**

single stand reversing plate mill

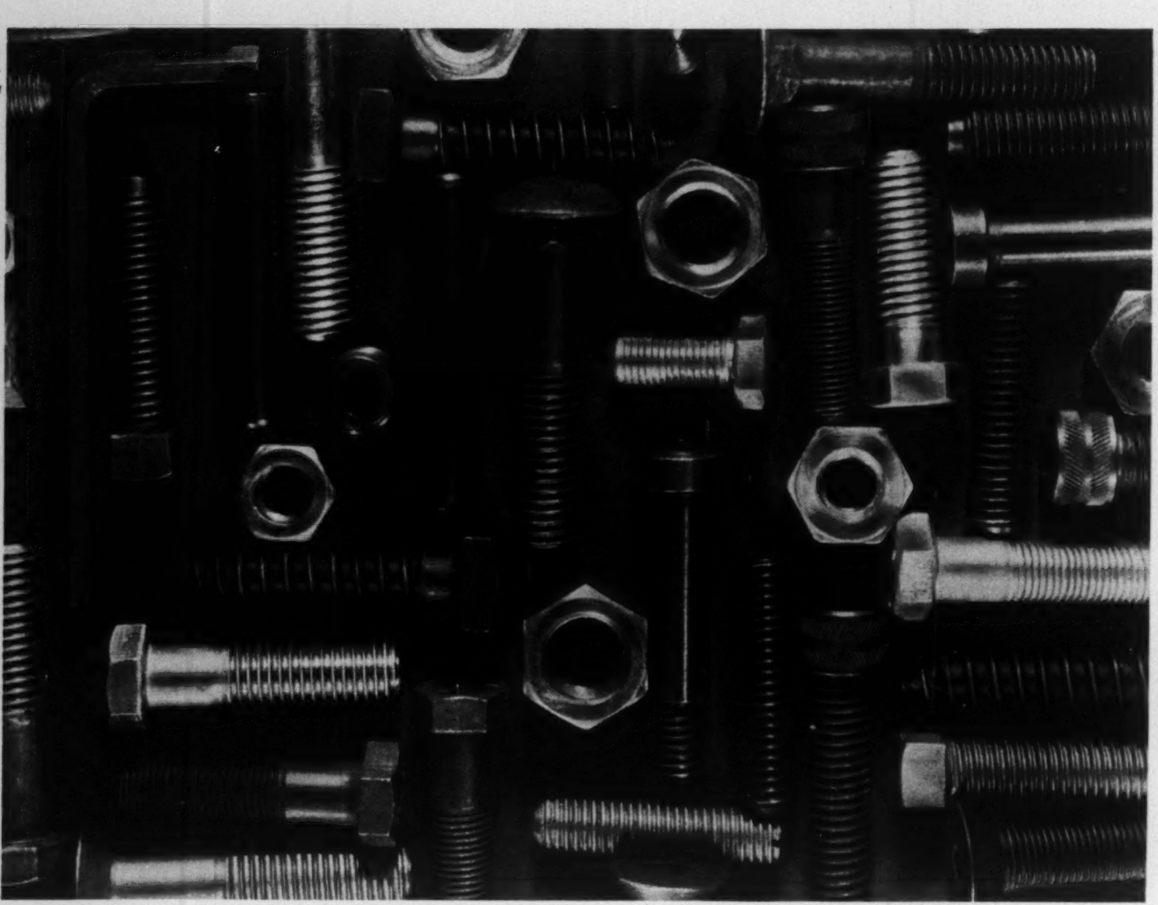
# BLAW-KNOX PLATE MILLS

Blaw-Knox designs and builds a full range of continuous or single stand reversing plate mills for rolling ferrous and non-ferrous slabs. Other Blaw-Knox equipment for the metals industry includes complete rolling mill installations and auxiliary equipment for ferrous and non-ferrous metals, sheet and strip processing equipment, electrolytic tinning, annealing, and galvanizing lines, seamless pipe and tube mills, draw benches, and cold draw equipment, Blaw-Knox Medart cold finishing equipment, iron, alloy iron and steel rolls, carbon and alloy steel castings, fabricated steel plate or cast-weld design weldments, steel plant equipment, and heat and corrosion resisting alloy castings. Blaw-Knox Company. Foundry and Mill Machinery Division. Blaw-Knox Building, 300 Sixth Avenue, Pittsburgh 22, Pennsylvania.

BLAW-KNOX

**BLAW-KNOX COMPANY**

*Foundry and Mill Machinery Division*
*Blaw-Knox Building • 300 Sixth Avenue*
*Pittsburgh 22, Pennsylvania*



Standard Screw Co.: Thousands of fasteners, like those above, are produced daily. Speedomax H helps spheroidize heading stock used for many of these Stanscrew fasteners.

# Reproducing annealing temperatures a problem?

Not for Standard Screw Co. at its Chicago Screw Co. Div., Bellwood, Ill., where Speedomax® H is helping to spheroidize 60 tons of coil a day for later production into Stanscrew fasteners. As part of their modernization and expansion program, Standard Screw recently installed one of the fastener industry's first continuous, pusher-type Surface Combustion furnaces . . . equipped it with Speedomax H controllers. After more than a year of operation, Speedomax H is reliably maintaining the selected time-temperature program . . . helping to reproduce again and again 85% spheroidization of pearlite in the structure of SAE-1038, 1041 and several low-alloy steels. Rugged and compact, this modern controller is providing equally dependable control for many other heat treating processes . . . helping to produce both process economies and a quality product. *Whatever your heat treat, it'll pay you to investigate Speedomax H!* For details, contact your nearest L&N office, or write 4957 Stenton Ave., Phila. 44, Pa.

*Six Speedomax H controllers regulate temperature of six furnace zones, reliably reproducing process temperatures 24 hours a day, 5 days a week.*

**LEEDS NORTHRUP**
Instruments Automatic Controls • Furnaces

# How TOCCO* Induction Annealing makes copper cable easier to handle in the field . . .

A world famous manufacturer of quality cable now treats its customers to the best with TOCCO-annealed cable that's easier to reel off, easier to splice and generally easier to handle in the field. Cable segments pass continuously through a TOCCO inductor coil at the rate of 23 feet per minute for the 800 mcm material illustrated. Many sizes of cable segments, up to one million circular mils, are annealed on one TOCCO unit.

TOCCO's many advantages over conventional annealing methods include:

1. TOCCO provides "bright annealing"—no discoloration.
2. TOCCO requires just a fraction of the space of conventional bell-type furnaces.
3. TOCCO's output is nearly four times that obtained by conventional annealing methods.
4. TOCCO equipment requires one operator as opposed to three required for the bell-type furnace operation.

Whether your products involve ferrous or nonferrous materials, look to TOCCO for an economical solution to your metal heating problems—annealing, brazing, hardening, melting or heating for forming or forging operations.

JUST PUSH A BUTTON

**TOCCO**

*Trade Mark Reg. U. S. Pat. Off.

**THE OHIO CRANKSHAFT COMPANY**

*Mail Coupon Today*—**NEW FREE Bulletin**

**The Ohio Crankshaft Co. • Dept. S-2, Cleveland 5, Ohio**

**Please send copy of "Typical Results of TOCCO Induction Hardening, Heat Treating and Annealing."**

Name________________________

Position________________________

Company________________________

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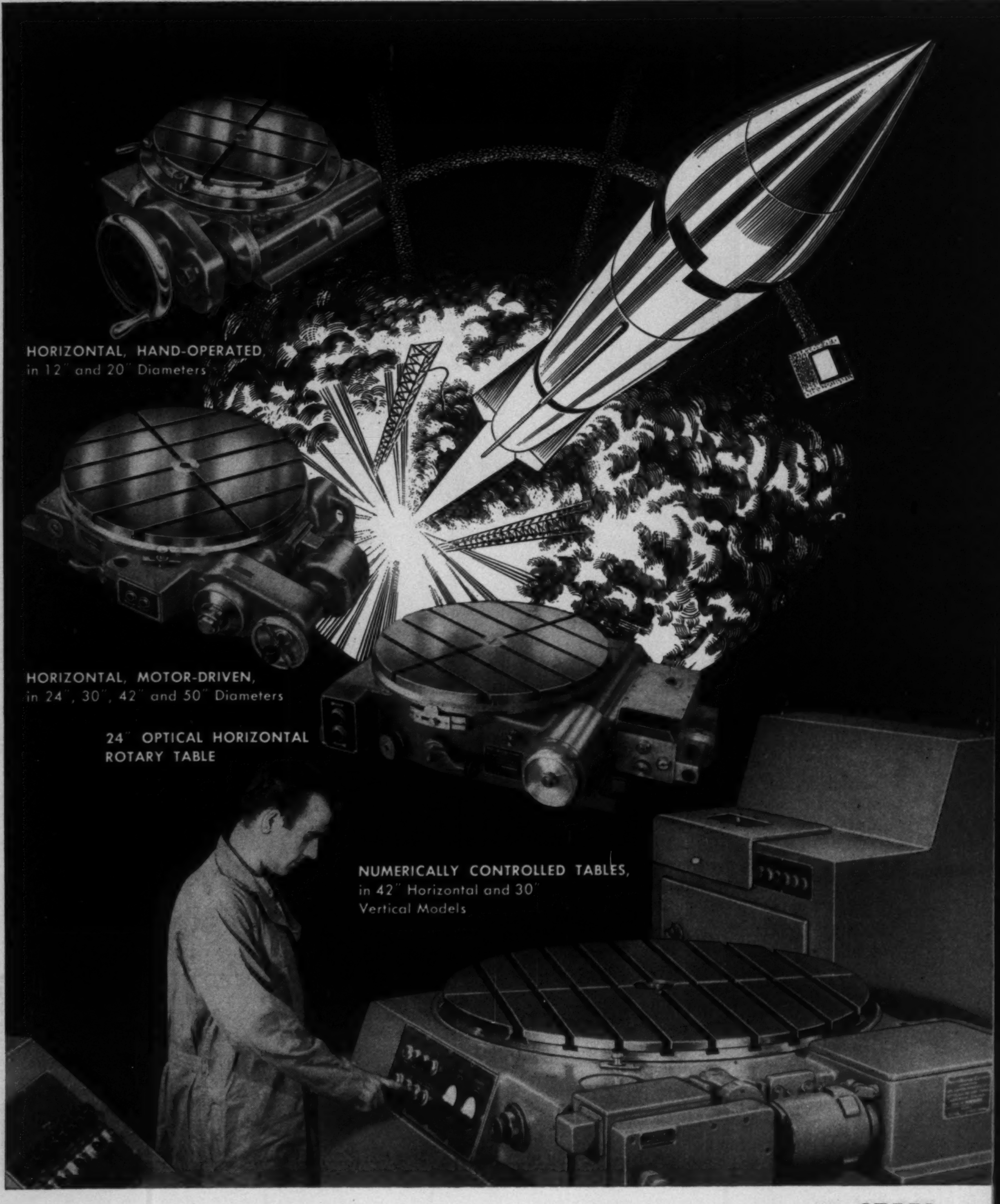
City________________ Zone____ State________

# ACCURACY


HORIZONTAL, HAND-OPERATED,
in 12" and 20" Diameters
HORIZONTAL, MOTOR-DRIVEN,
in 24", 30", 42" and 50" Diameters
24" OPTICAL HORIZONTAL ROTARY TABLE
NUMERICALLY CONTROLLED TABLES,
in 42" Horizontal and 30" Vertical Models

# ASSURED...

## Where pin-point precision is essential!
## PRATT & WHITNEY Precision ROTARY TABLES

**In the spacecraft and missile field . . .** and in a very wide range of other applications throughout industry, Pratt & Whitney Precision Rotary Tables are first choice wherever the ultimate in dependable accuracy for circular spacing and angular position is a must! Playing an important part in America's space-missile program, P&W Rotary Tables are used for machining, calibrating and testing in the construction of the missiles. They are also used for the extremely critical job of aiming the missiles for firing. Accurate to 2 seconds of arc, the tables used for aiming are equipped with optical attachments and are employed as azimuth indicators.

Providing the right type and size for every requirement, only Pratt & Whitney offers a truly complete line of *precision* tables. As shown on these pages, Horizontal, Vertical, and Tilting types, in Hand-Operated and Motor-Driven models, are supplied in 12" to 50" diameters. Optical, Automatic Indexing, and Numerically Controlled types are also produced. Certified accuracies as high as 2 seconds of arc — from any point to any other point within a full 360° — can be supplied.

If your operations involve circular spacing or angular positioning, the logical tool to reduce costs and insure greater accuracy is a rotary table. And to insure the model *and* the precision you need, it's logical to choose a Pratt & Whitney *Certified Accuracy* Rotary Table. For complete information, call the P&W Branch Office in your area... or write direct, outlining your requirements.

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*13 Charter Oak Boulevard, West Hartford, Connecticut*

100th Anniversary
1860 PW 1960

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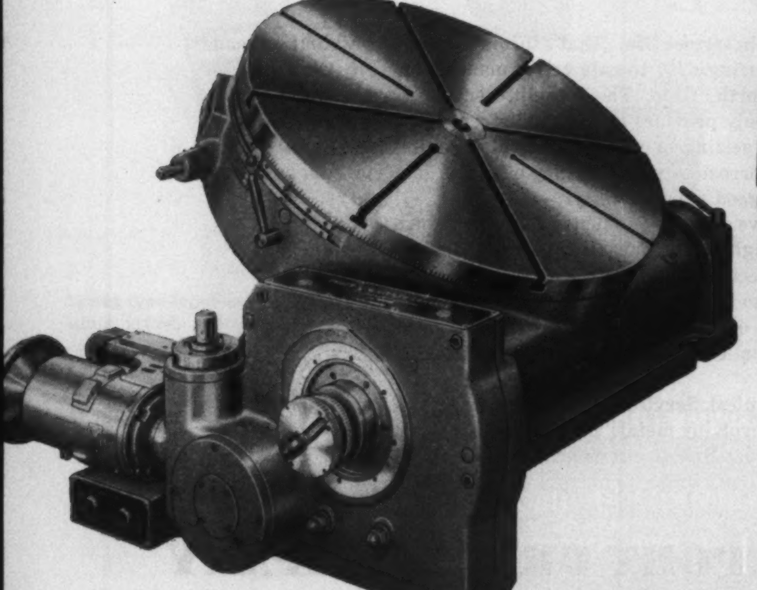
*FIRST CHOICE FOR ACCURACY*
**MACHINE TOOLS • GAGES • CUTTING TOOLS**



**TILTING, HAND-AND POWER-ROTATED,**
**in 10", 16", 24" and 36" Diameters**

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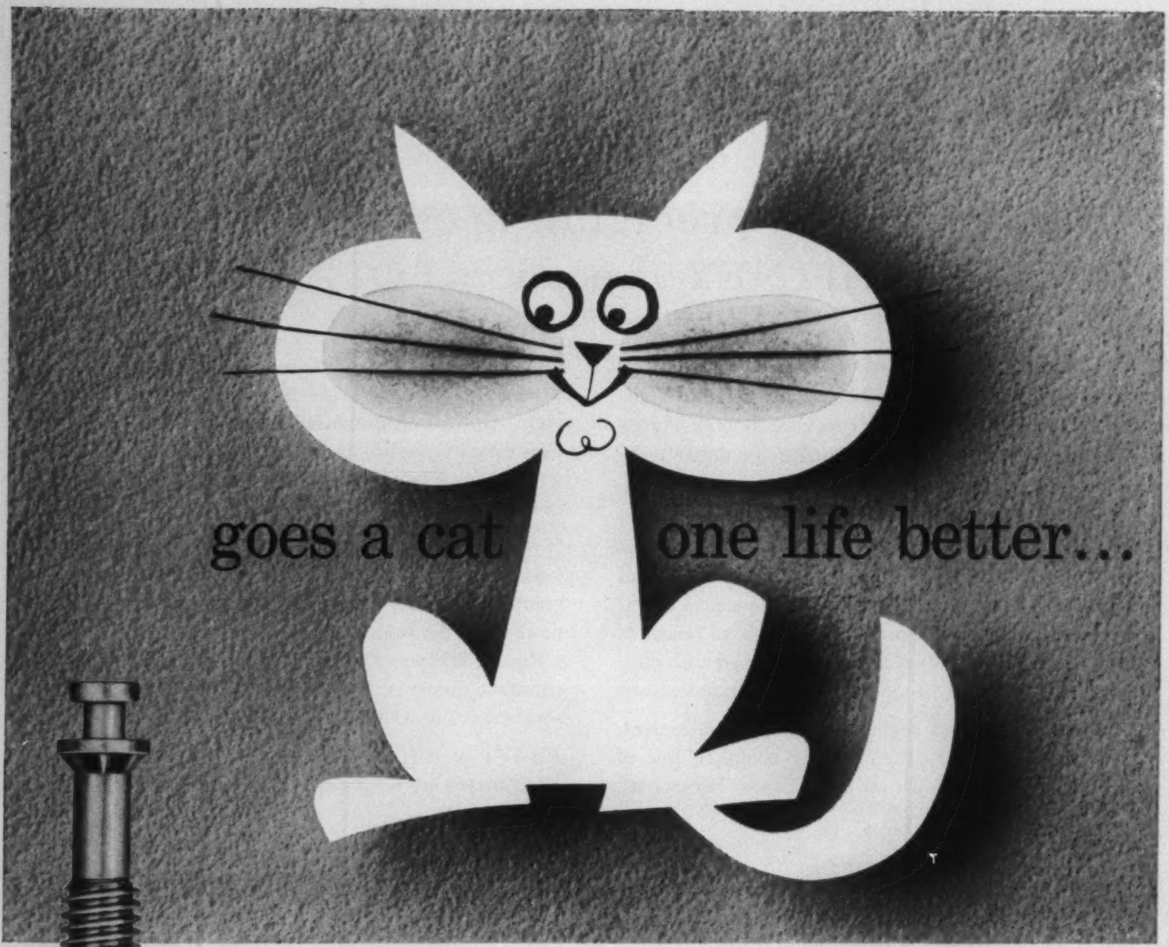
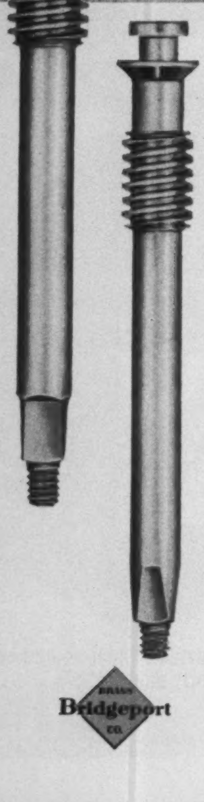
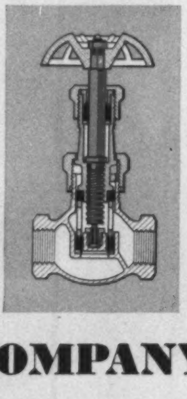
**in 30" and 48" Diameters**


goes a cat one life better...



# Bridgeport Duronze 707

**A tenfold increase in service life... that's the outstanding contribution made by Bridgeport's Duronze 707 to gate valves manufactured by Ohio Injector Company, Wadsworth, Ohio. The big difference is in the valve stems. Duronze 707 not only provides exceptional strength in the stems, but also eliminates risk of seizing or galling. Thread wear is kept to a minimum. In addition, this corrosion-resistant alloy offers an important manufacturing advantage in good machinability.**



The toughest valve stems the industry has ever known were evolved through close cooperation between Bridgeport and Ohio Injector metallurgists. This type of cooperation is open to all manufacturers. It means that a *standard* alloy can often be chosen to provide the most effective and economical solution to product or production problems.

Bridgeport Technical Service will gladly advise you on any problems involving metals and their application. Just call your nearest Bridgeport Sales Office—or write directly to Bridgeport Brass Company, Bridgeport 2, Conn., Dept. 3902.

**BRIDGEPORT BRASS COMPANY**

Bridgeport 2, Connecticut

*Specialists in Metals from Aluminum to Zirconium*

# How to dress Safely for 3000°F molten splash exposure!

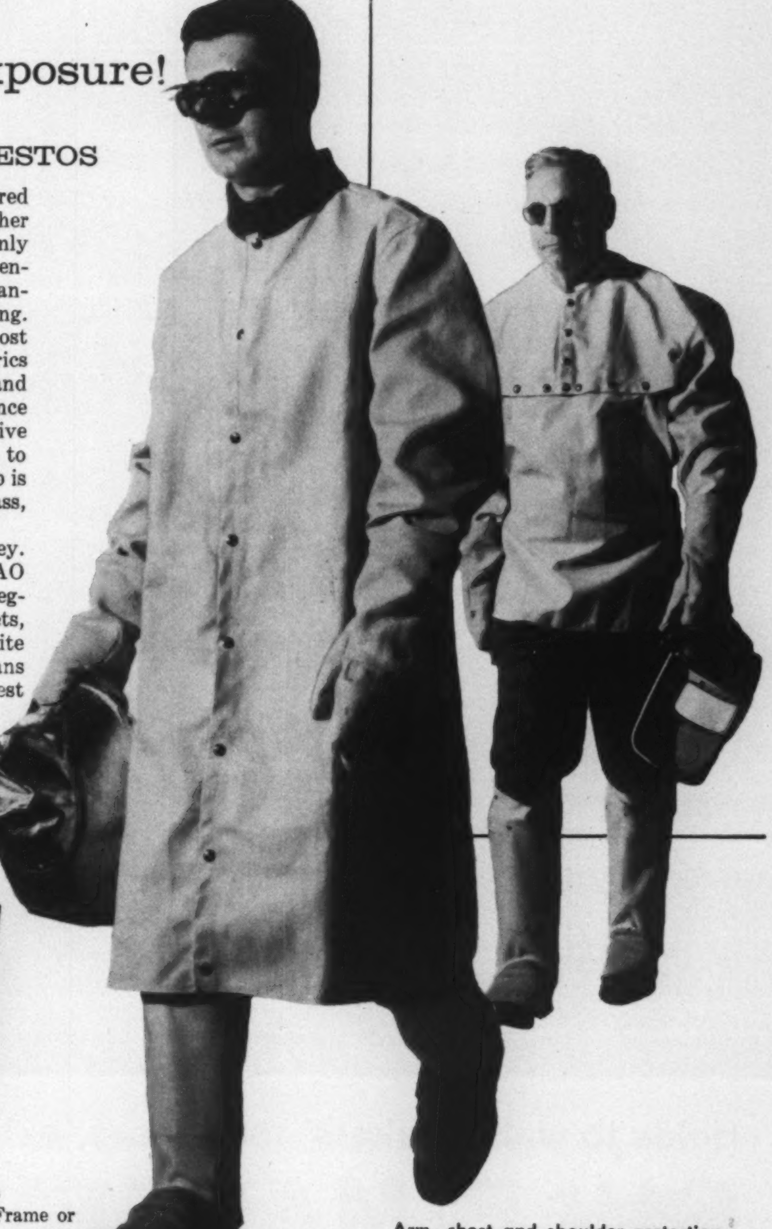
## AO THERMOGARB ASBESTOS

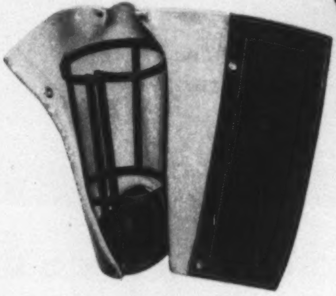
It won't burn or char when spattered with 3000°F molten metal splash (other fabrics will)! A 30 inch coat weighs only 3¾ lbs. as against 6½ lbs. for conventional asbestos! These are major advantages of AO Thermogarb asbestos clothing.

This remarkable material offers almost double the tensile strength* of fabrics twice its weight and thickness . . . and 40% — 50% greater abrasion resistance than untreated asbestos. Your protective clothing dollars go farther. In addition to high heat and metal splash, Thermogarb is recommended for exposures to glass, chemicals, ceramics and oils.

AO Thermogarb will save you money. It is available in a complete line of AO protective clothing including coats, leggings, cape sleeves, coveralls, sleevelets, spats, pants, chaps and aprons — in white or yellow. ("W" before cat. no. means white. "Y" means yellow.) Your nearest AO Safety Products Representative can supply you.

*Even before treatment, more after treatment.





**Spring type legging with replaceable covers** which attach to frame by snap fasteners. Frame or covering can be ordered separately. Cat. No. W1481.

**Arm, chest and shoulder protection** in a cape sleeve and bib. All seams double stitched. Bib attached to front of cape with snap fasteners. Anchor button at each armpit. Cat. No. W208B.

**Coat completely protects from neck to below knees.**
Wool collar. Snap fastener adjustment on cuffs for snug fit. Snap fasteners on front have leather pull tabs for quick removal. All seams double-stitched. 6 standard coat lengths — coat shown is 44". Cat No. W204-44.

**BE SAFE FOR SURE — WITH AO SUREGUARD PROTECTIVE EQUIPMENT**

*Always insist on*
*AO Trademarked*
*Safety Products.*

American AO Optical
COMPANY
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS
*Safety Service Centers in Principal Cities*

A09-102

## Holds to watchmakers' tolerances, extends tool life 4 times

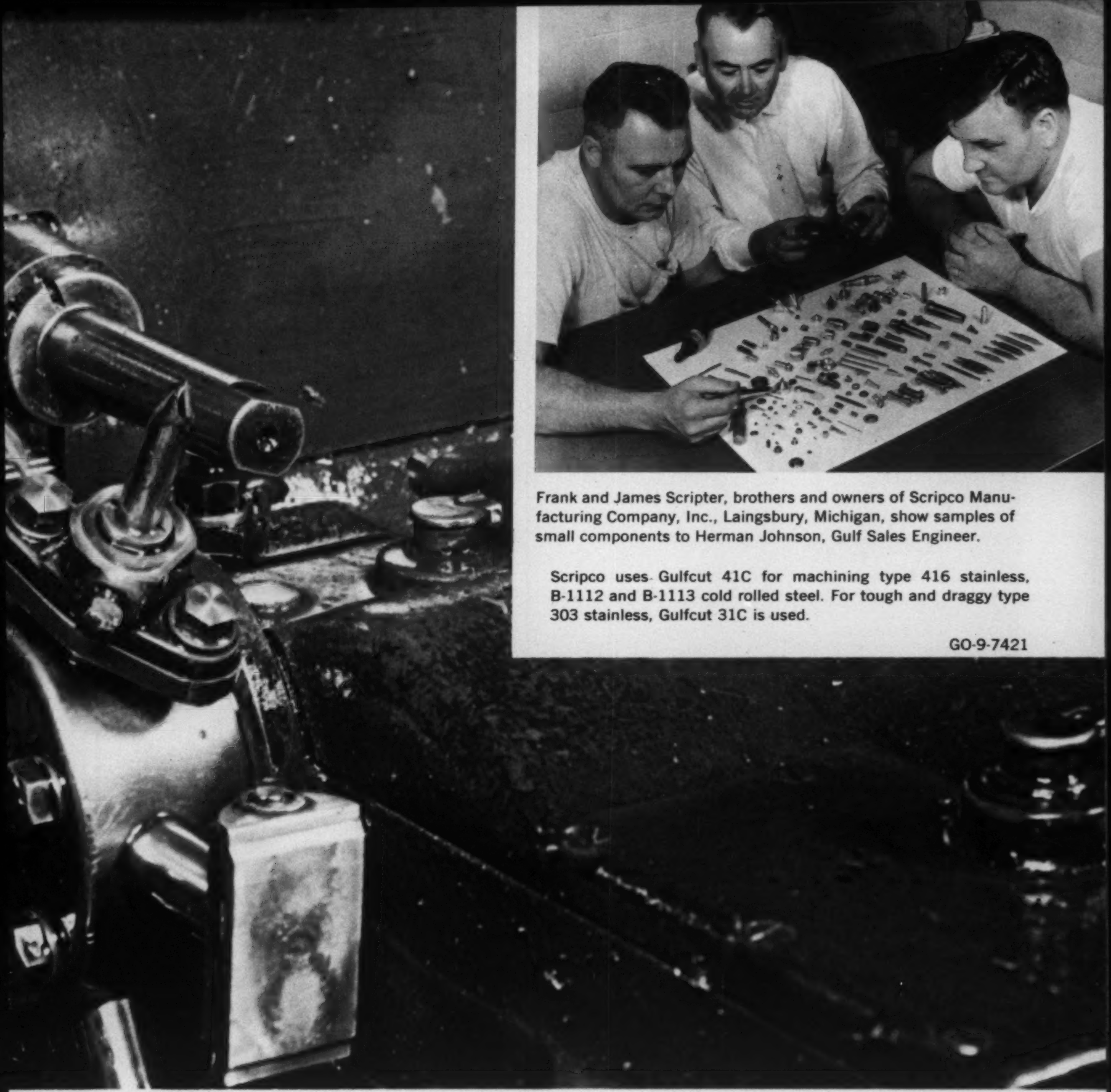
# GULF MAKES THINGS

Fishing reel parts and small precision components for the aircraft industry don't seem to have much in common, except at Scripco Manufacturing Company, Inc., of Laingsbury, Michigan.

Scripco specializes in machining small pieces to exacting specifications. Take spinning reel drive gear stems, for example. When completed they're 1.341″ long. Scripco cuts them from B1113 steel in a single-spindle Brown & Sharpe at 230 sfm. Diameters (eight of them) must be held to tolerances of .0001″. Length must be held to .008″, thickness to .002″ and concentricity to within .002″. Made in 6 operations, pieces take 25 seconds to complete.

"To stay out of trouble on this job, we use Gulfcut 41C," says partner Frank Scripter. "It has just the right amount of sulfur to reduce cutting drag, without corroding the fine threads on this piece."

On another job—machining phosphor bronze pieces—Scripco quadrupled tool life by switching to Gulfcut. Previously they got only 1½ hours of tool life—now with Gulfcut they get a full 6 hours before regrinding.



Frank and James Scripter, brothers and owners of Scripco Manufacturing Company, Inc., Laingsbury, Michigan, show samples of small components to Herman Johnson, Gulf Sales Engineer.

Scripco uses Gulfcut 41C for machining type 416 stainless, B-1112 and B-1113 cold rolled steel. For tough and draggy type 303 stainless, Gulfcut 31C is used.

GO-9-7421

## with Gulfcut® oils . . .

# RUN BETTER!

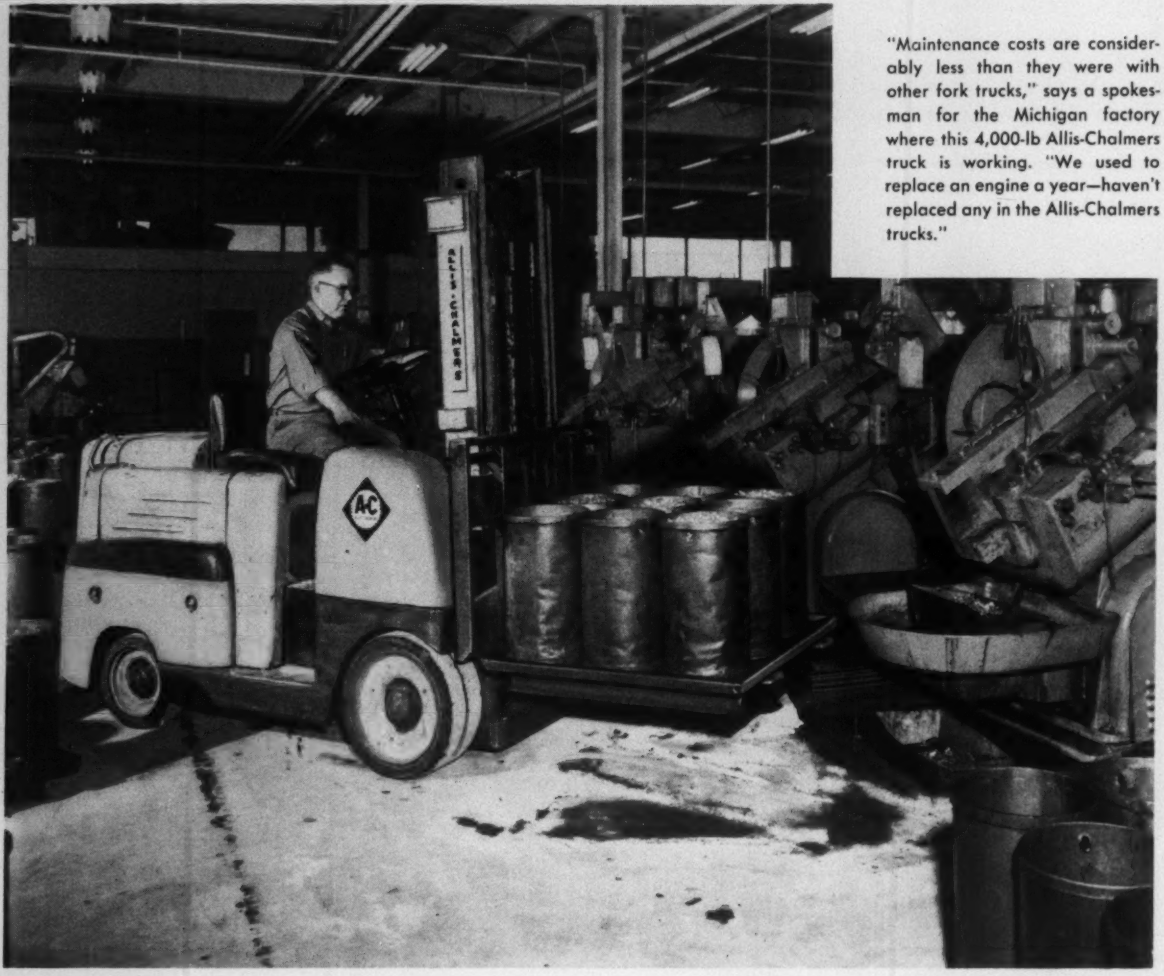
"With Gulfcut oils we can meet the exacting tolerance and finish specs required by the aircraft industry and our other customers. We can do it economically, too, because longer tool life means a smoother flow of production" says James Scripter.

See for yourself how Gulf makes things run better! Just call your nearest Gulf office. And use the coupon to get your free copy of the new 116-page manual "Metal Machining with Cutting Fluids." It contains complete information on cutting oil selection and usage.

GULF

**GULF OIL CORPORATION**
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.
Send free copy of "Metal Machining with Cutting Fluids."

Name________________
Title________________
Company________________
Address________________
City________ Zone____ State________



"Maintenance costs are considerably less than they were with other fork trucks," says a spokesman for the Michigan factory where this 4,000-lb Allis-Chalmers truck is working. "We used to replace an engine a year—haven't replaced any in the Allis-Chalmers trucks."

## There's a
## dollar-saving difference
## in Allis-Chalmers Lift Trucks
## . . . and the difference grows by the hour.

Sometimes it takes 10,000 hours or more to prove: No other lift truck can be expected to operate as steadily, as economically for as long a time as an Allis-Chalmers.

This is a conclusion reached by users in many different industries. They are users who have kept detailed records of operation and maintenance costs . . . that *prove* there is a dollar-saving difference. Many of their case histories are available for the asking.

Let your Allis-Chalmers dealer show you some of the many years-ahead design features that make the dollar-saving difference. Allis-Chalmers, Milwaukee 1, Wisconsin.

**ALLIS-CHALMERS**

BH-128C

**Quality control at Standard** is second to none among the nation's major specialty product steel plants. It is maintained by the most accurate, up-to-date testing equipment available. The laboratory facilities operate around the clock to keep all vital information flowing to our metallurgists, shop foremen, mill and machine operators—as well as to plant management, and, of course, our customers.

Bring your next unusual product to us—we'll welcome the opportunity to serve you regardless of the alloy it might require. Send for the free illustrated booklet, "Quality Control at Standard."

**Standard Steel Works Division**
**BALDWIN · LIMA · HAMILTON**

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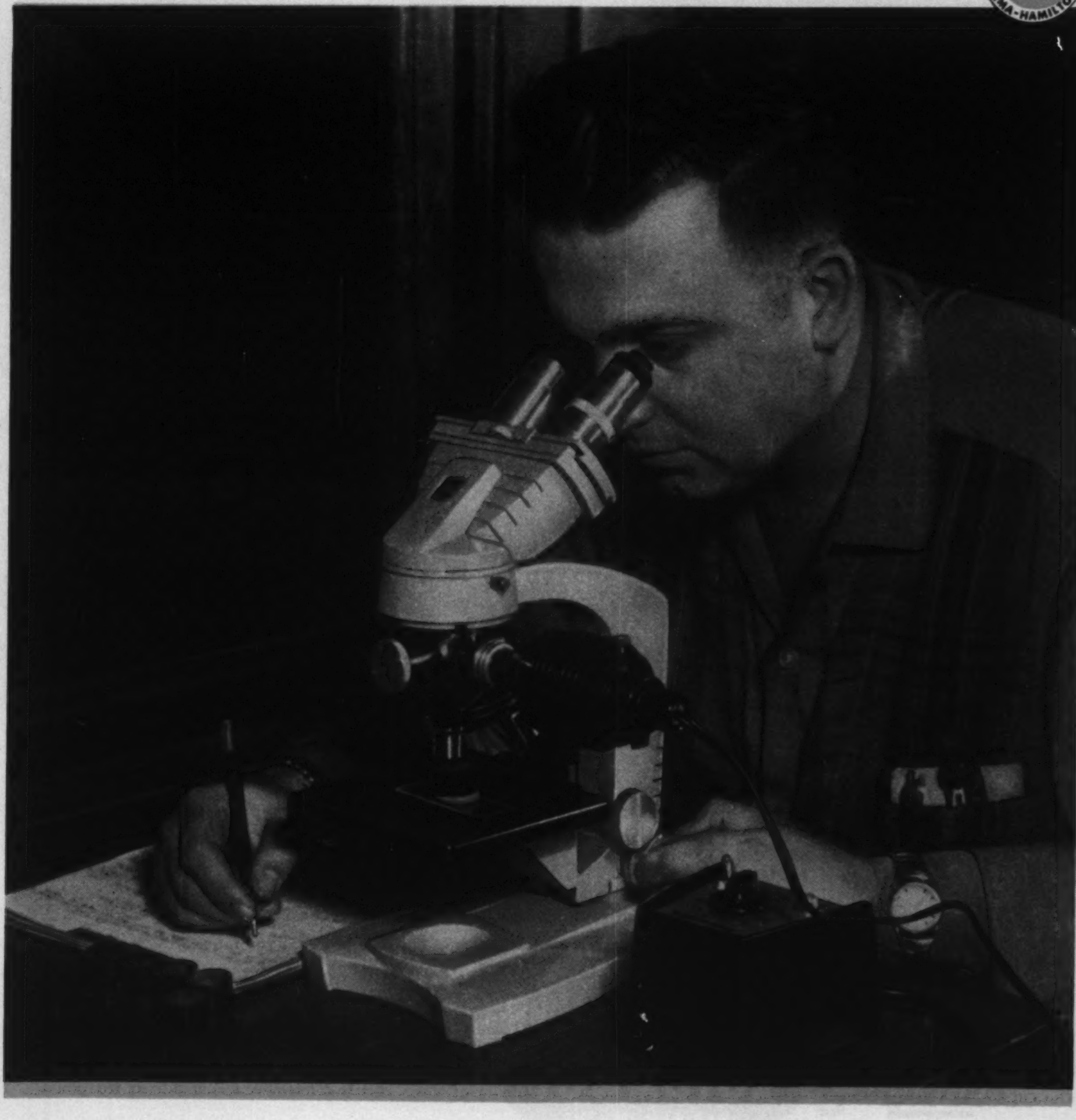
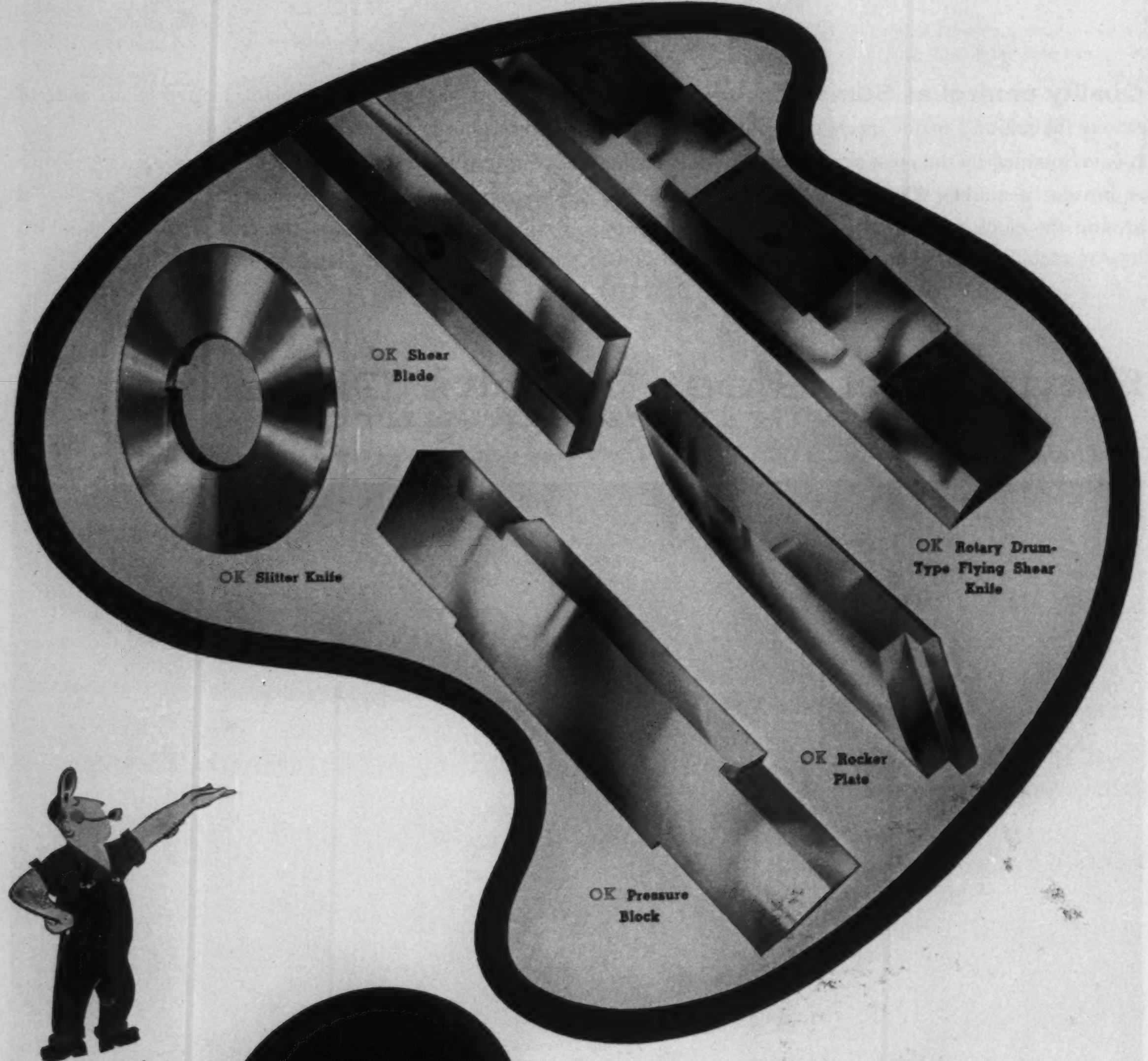
Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes




OK Shear Blade
OK Slitter Knife
OK Rotary Drum-Type Flying Shear Knife
OK Rocker Plate
OK Pressure Block

# it's OK ...let 'er go!

In hundreds of Mills and Fabricating Plants throughout the nation, Wear Plates and Machine Knives made by the Ohio Knife Co. are delivering extra long service life with resultant production cost savings in the toughest services.

1. **Only the finest tool steel is used conforming to our exacting metallurgical standards.**
2. **Our exclusive heat treating process assures the proper uniform hardness and temper to best suit your individual cutting or wear problems.**
3. **Precision grinding of all pieces to ± .00025 or less if you require.**

*For free bulletin, "SLITTING—A Basic Guide for the New Operator", write Dept AF.*

***Manufacturers of***

**Hardened Spacers • Ways • Gibs • Ball Races • Slitter Knives • Wear Strips • Shear Blades • Work-Rest Blades Cut-Off Blades • Bronze Ways**

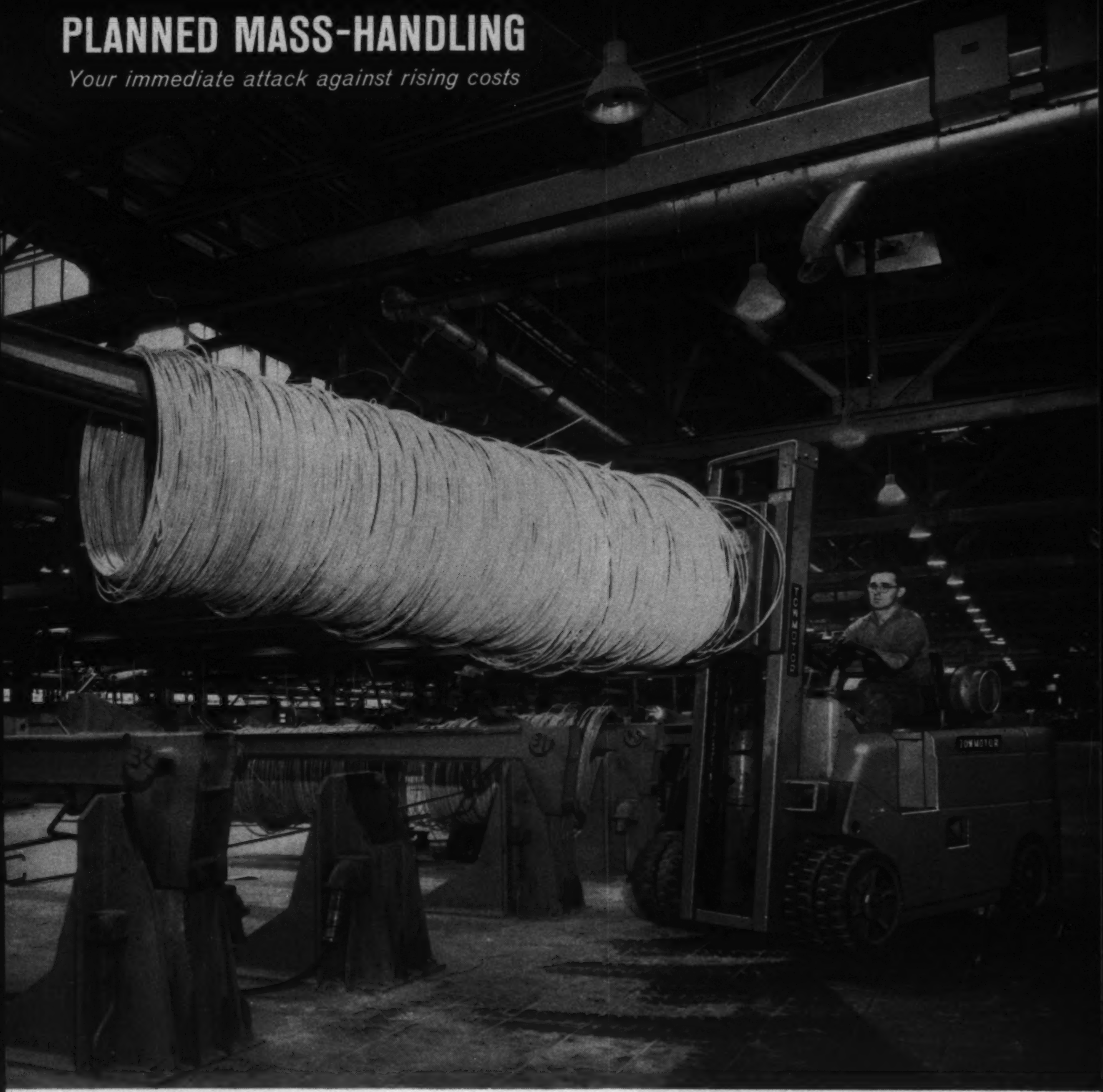
GO WITH OHIO GREEN

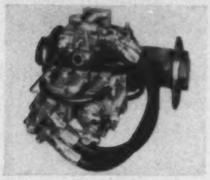
**THE OHIO KNIFE CO.**

CINCINNATI 23, OHIO

# PLANNED MASS-HANDLING

*Your immediate attack against rising costs*





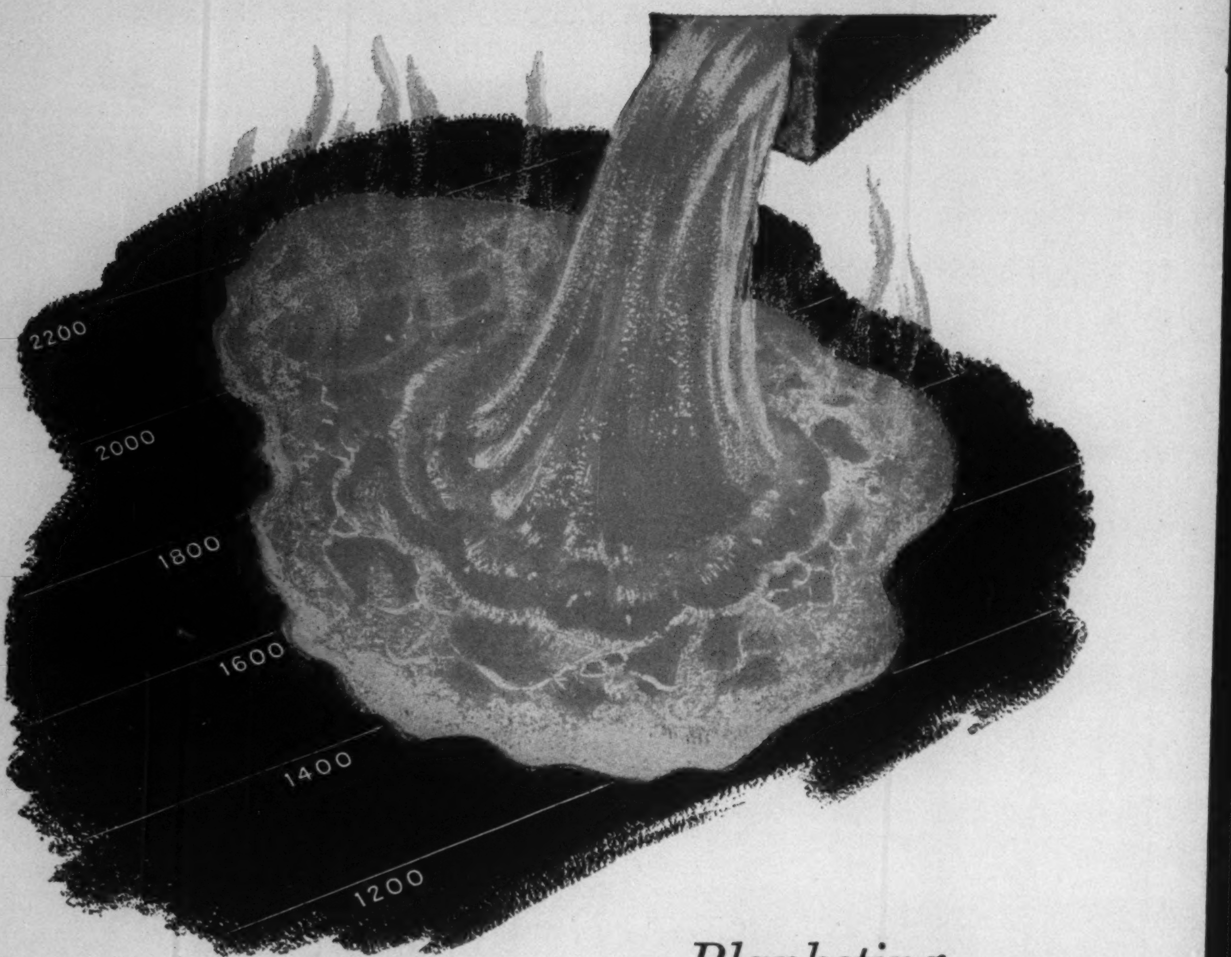
IT'S A FACT: The unique Towmotor Towmostatic Drive guarantees handling flexibility, smooth operation and maintenance benefits far greater than any other fork truck drive.

**YOUR SHORTCUT TO EXTRA PROFIT** is through planned mass-handling that puts the right product in the right place at the right time. Integrating TOWMOTOR fork lift trucks into your production operation is the fastest way to lower costs and increase profits. Write for case studies that show you how similar companies are reducing costs through more effective handling operations. TOWMOTOR CORPORATION, CLEVELAND 10, OHIO.

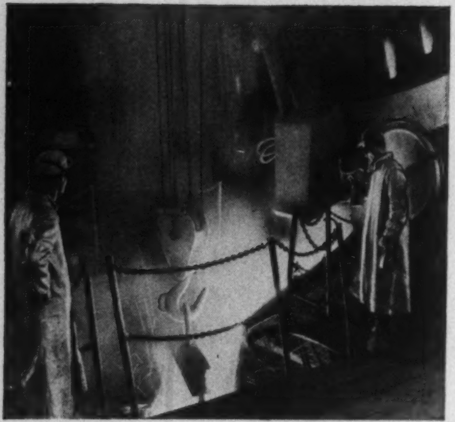
FORK LIFT TRUCKS, CARRIERS AND TRACTORS SINCE 1919

**TOWMOTOR** THE ONE-MAN-GANG ® -GERLINGER

Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation



# *Blanketing the high temperature field*



Close control is exercised over every step in the production of HAYNES alloys. This electric arc furnace is part of the modern mill set-up maintained at HAYNES STELLITE.

A fairly ambitious claim! Yet we can prove that HAYNES alloys do exactly that . . . all the way up to 2000+ deg. F. Here's why. There are 12 HAYNES high-temperature alloys. Among them you will find the right combination of properties to handle any heat condition. For example, HASTELLOY alloy X has remarkable resistance to oxidation up to 2200 deg. F. HAYNES alloy No. 25 is strong and resists stresses, oxidation, and carburization up to 2000 deg. F. HASTELLOY alloy R-235 is outstanding in the 1500 to 1750 deg. F. range. And this is only part of the story. All 12 HAYNES alloys are *production* alloys and are readily available. Some of them are vacuum melted; some air melted. Some are cast, some wrought, and some are produced in both forms. For the full story, write for literature.

**HAYNES**
**ALLOYS**
**HAYNES STELLITE COMPANY**
*Division of Union Carbide Corporation*
Kokomo, Indiana

UNION CARBIDE

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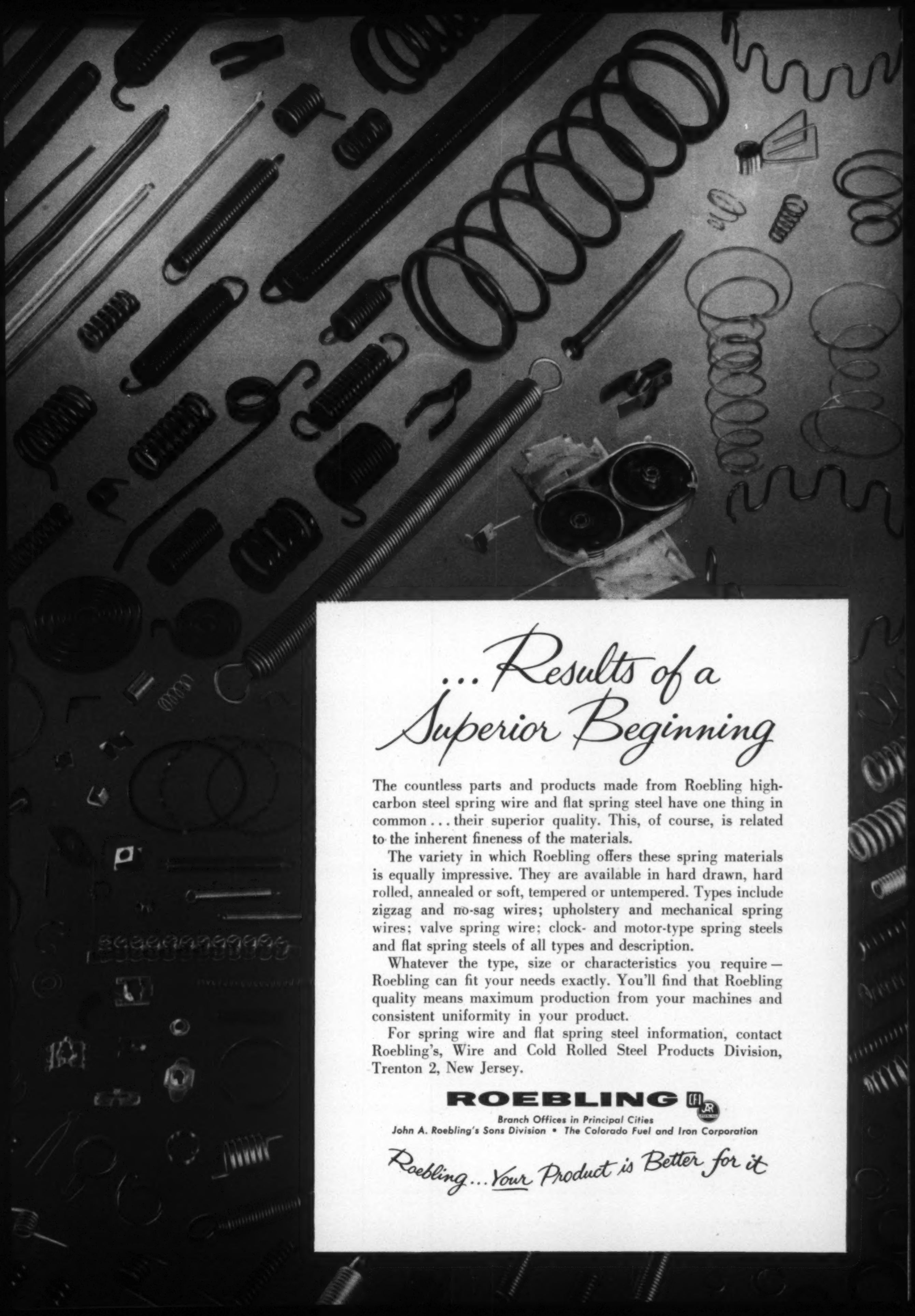


# . . . Results of a Superior Beginning

The countless parts and products made from Roebling high-carbon steel spring wire and flat spring steel have one thing in common . . . their superior quality. This, of course, is related to the inherent fineness of the materials.

The variety in which Roebling offers these spring materials is equally impressive. They are available in hard drawn, hard rolled, annealed or soft, tempered or untempered. Types include zigzag and no-sag wires; upholstery and mechanical spring wires; valve spring wire; clock- and motor-type spring steels and flat spring steels of all types and description.

Whatever the type, size or characteristics you require — Roebling can fit your needs exactly. You'll find that Roebling quality means maximum production from your machines and consistent uniformity in your product.

For spring wire and flat spring steel information, contact Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey.

**ROEBLING**

Branch Offices in Principal Cities
John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

*Roebling . . . Your Product is Better for it*

LOOK FOR THE DIAMONDS—SIGN OF FINISHING QUALITY

# 4 good reasons why you should use IRIDITE®

**Chromate Conversion Coatings**

# ON YOUR ZINC OR CADMIUM PRODUCTS

## CORROSION PROTECTION

The wide range of Iridite coatings available gives you a choice of corrosion protection—from economical, mild protection of parts for shipment, storage or display, to extremely high protection under exposure to marine and highly humid atmospheres, gasoline or other hydrocarbons.

## PAINT BASE

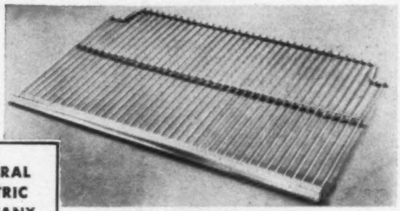
For an extremely tight bond for either baked or air-dried paints, non-porous Iridite blocks moisture penetration—prevents formation of metallic soap products beneath paint coatings.

## APPEARANCE

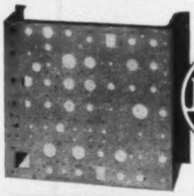
Your choice of colors ranging from clear through yellow iridescent to olive drab. Bright Iridite finishes can also be dyed to provide other color effects.

## SPECIAL EFFECTS

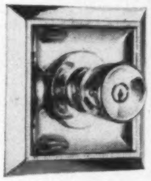
Iridite, in combination with other Allied Research processes, can provide a wide variety of finishes. As an example, Iridite 8-P applied to zinc or cadmium, followed by an application of Irilac, gives a highly attractive simulated brass finish.



**GENERAL ELECTRIC COMPANY**



RCA

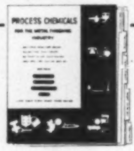


**Medalist**
**NATIONAL LOCK COMPANY**

WEIRTON STEEL COMPANY

**IRIDITE**—a specialized line of chromate conversion coatings for nonferrous metals. Easily applied at room temperatures with short immersion times, manually or with automatic equipment. Forms a thin film which becomes an integral part of the metal. Cannot chip, flake or peel. Special equipment, exhaust systems or highly trained personnel not required.

**For complete information on Iridite, contact your Allied Field Engineer. He's listed in the yellow pages under "Plating Supplies." Or, write for FREE TECHNICAL DATA FILES.**



*Allied Research Products, Inc.*

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BRANCH PLANT: 400 MIDLAND AVENUE • DETROIT 3, MICHIGAN
*West Coast Licensee for Process Chemicals: L. H. Butcher Co.*

*Chemical and Electro chemical Processes, Anodes, Rectifiers Equipment, and Supplies for Metal Finishing*

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**PITTSBURGH, PENNSYLVANIA**

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SUBSIDIARIES: Adamson United Company, Akron, Ohio; Stedman Foundry and Machine Co., Inc., Aurora, Indiana

**Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.**

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# TAPEnology saves "face"... polished metal stays blemish free!

Forming and handling polished metal sheet can be speeded . . . rejects almost eliminated . . . by using "SCOTCH" Brand Masking Paper and tight-holding "SCOTCH" Brand Masking Tape. Applied prior to forming operations, such protective masks guard polished surfaces against scratches, die marks, staining—may be left on right through shipping if desired, yet removes easily and cleanly. Application can be kept up to production line speed by using "SCOTCH" Brand Apron Tapers to apply the tape to one or both edges of the paper as it is pulled from the roll. Fast, easy, economical . . . the cost-saving way to increase handling speeds on flat, polished metal stock.

**Looking for Cost Saving Short Cuts?** No matter what your metal-working operations include, chances are "TAPEnology" can help you do it faster, better, at less cost. Ask your nearest "SCOTCH" Brand Tape Distributor for complete information, or write: 3M Co., St. Paul 6, Minn., Dept. IAU-20.

*When tape costs so little, why take less than "SCOTCH" Brand?*

"SCOTCH" is a registered trademark for the pressure-sensitive adhesive tapes of 3M Co., St. Paul 6, Minn. Export: 99 Park Ave., New York 16. Canada: London, Ontario.

**MINNESOTA MINING AND MANUFACTURING COMPANY**
**. . . WHERE RESEARCH IS THE KEY TO TOMORROW**

3M COMPANY

JONES & LAUGHLIN STEEL WAREHOUSE DIVISION

JL

The Department Store of Steel

**J & L Steel Service Centers**—efficient and dependable. Anywhere you look—from the order department to the shipping floor, from storage to processing equipment like this friction saw—you'll find something new, something better at The Department Store of Steel. Unparalleled expansion, new buildings, the latest machinery and equipment, increased stocks of steel, stainless and aluminum, and skilled warehousemen trained to give *extra* care to every order—all add up to faster, more efficient service for J & L customers.

Take advantage of the streamlined, time-saver service J & L offers. Count on The Department Store of Steel. You'll get exactly what you want—when you want it.

**J & L Steel Warehouse Division**

CHICAGO • CINCINNATI • CLEVELAND • DETROIT
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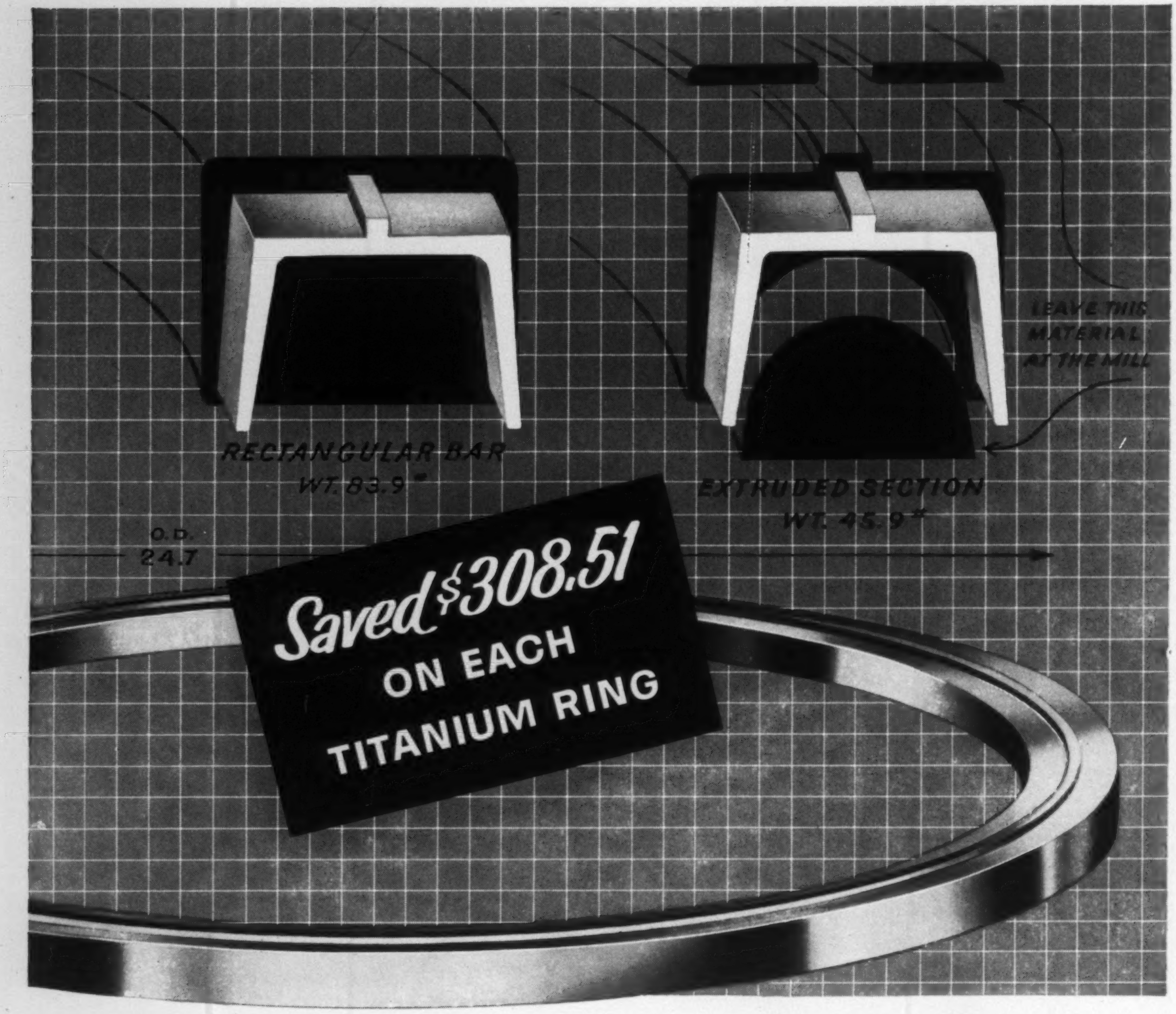

LEAVE THIS MATERIAL AT THE MILL
RECTANGULAR BAR
WT. 83.9#
EXTRUDED SECTION
WT. 45.9#
O.D.
24.7
Saved $308.51
ON EACH
TITANIUM RING

# Flash butt-welding titanium extruded section eliminates 38 lbs. of material...plus machining

When an extruded shape closely approximates the finished cross-section of a circular part, you can save money—particularly where expensive materials are involved. This titanium ring was circular formed and flash butt-welded from the section shown above. Material savings were $262.00 per ring, plus $46.00 on machining.

Amweld is equipped to supply flash butt-welded rings and circular products in stainless, titanium, aluminum, as well as a wide variety of corrosion-resistant alloys. If you would like to know more about Amweld's welding, fabricating and complete machining facilities, phone or write.

**GET THE FACTS ABOUT AMWELD**

New 20-page catalog describes flash butt-welded rings and circular products manufactured by Amweld. Also booklet entitled, "How Flash Butt-Welded Rings are Made."

**AMWELD® INDUSTRIAL PRODUCTS**

THE AMERICAN WELDING & MFG. CO. • 110 DIETZ ROAD • WARREN, OHIO

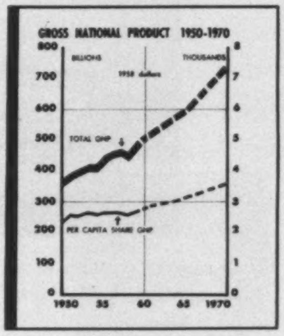
STEEL

February 15, 1960

# Metalworking Outlook

## 1970 Living Standards: How High?

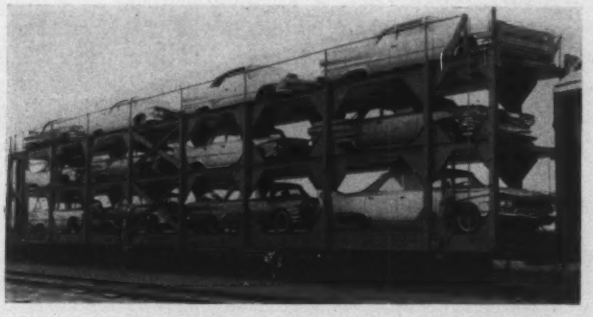
Estimating U. S. prospects for a higher standard of living, the Department of Labor predicts: A gross national product of $731.7 billion by 1970. Assuming a population of 208.2 million, it equals a $3500 per capita share (vs. $2800 today in terms of 1958 dollars). Concludes the Labor Department: "This means that by 1970 we can provide our expanding population with a 25 per cent increase in its standard of living." The forecast assumes continuing high levels of economic activity, employment and technological advance.



## GE Urges Capital Spending Efficiency

Electric utility companies can save more than a half billion dollars in the next ten years by changing their cyclical buying habits, says William S. Ginn, vice president and general manager of General Electric Co.'s Turbine Div. Mr. Ginn urged utilities to buy new generating equipment on the basis of historical growth trends, adding capacity, perhaps before it is needed in some cases. He says the inefficiencies resulting from traditional buying include: Overexpansion in manufacturers' plants to meet peak demands; violent swings in the manufacturer's labor force and labor costs; increased social benefits demanded by labor to meet the uncertainties of cyclical production. "Production costs," adds Mr. Ginn, "tend to run over 10 per cent higher under cyclical conditions than they would under more stable conditions."

## Piggyback Traffic Riding High



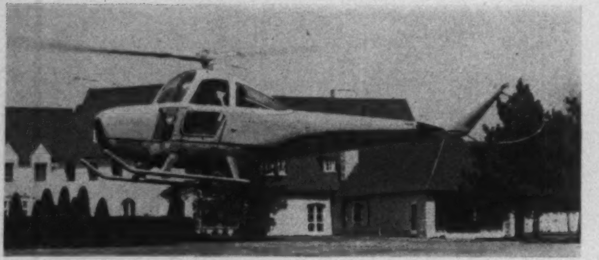
Piggyback rail traffic reached 415,156 loadings in 1959, 50 per cent above the 1958 figure and 67 per cent above 1957's, reports the Association of American Railroads. One newcomer to the fleet is this trilevel, auto-carrier model, the largest ever built by Pullman-Standard Div., Pullman Inc. It goes

Technical Outlook—Page 119

Market Outlook—Page 157

into service this month on the Frisco Railroad. Designed by Pullman-Standard and Chrysler Corp. engineers, the car accommodates 12 full size autos or 15 compacts.

## Business Flying Soars in '59



Private aircraft builders, up in the clouds because of 1959 business, are hoping for another decade to match the fifties. The general aviation market, which includes all civilian flying except commercial airlines, took delivery of 20 per cent more aircraft last year than it did in 1958. Retail value: $170 million. Business air travel, the fastest growing segment of general aviation, has more than doubled since 1950; companies own almost two-thirds of all general aviation craft in service. Business usage of whirlybirds like the one above has advanced sixfold since 1954.

## Ford Plant Adds Work Shift . . .

Ford Motor Co.'s Wixom, Mich., assembly plant will add a second shift late this month after 800 additional workers have been hired, says Plant Manager William D. Singleton. The plant, which produces Thunderbirds, Lincolns, and Lincoln Continentals, has worked heavy overtime schedules during the last two years. Current passenger car production averages 460 cars a day. The addition of the second shift, scheduled to begin Feb. 29, will bring employment at the plant to about 4100.

## Willys Revs Up New Assembly Line . . .

Willys Motors Inc., Toledo, Ohio, is activating a second final assembly line to meet booming sales demand for its Jeep line of four-wheel drive vehicles. C. W. Moss, vice president-sales, says orders for Jeeps from U. S. dealers are running 300 per cent ahead of last year's pace. The new assembly operation required the addition of 250 workers, bringing the Toledo work force to 6200 employees.

## . . . But Appliancemaker Cuts Output in Half

Easy Laundry Appliance Div., Murray Corp. of America, Syracuse, N. Y., is cutting back its operations about 50 per cent and furloughing 400 to 500 of its 1000 employees for three to four weeks. Michael Miga Jr., personnel director, says that an oversized inventory is behind the curtailment. He explains that appliance dealers overstocked last fall in anticipation of the steel strike, but retail sales did not materialize to the extent they expected. Result: Dealers are overstocked and factory inventories have piled up.

## Predicts Forging Industry 25 Per Cent Upswing

Forging industry executives look for 1960 business to be as much as 25 per cent above 1959 levels, reports the Drop Forging Association. Several Midwestern forge plants report the largest backlog of orders in years, with new orders up 30 to 35 per cent. Commercial forge plants geared to production of automotive parts expect to follow an auto industry upswing of more than 20 per cent. Comments one executive: "At present, we're practically feeding the hammers right out of the truck."

## Republic's White Wins Fairless Award

Charles M. White, chairman and chief executive officer, Republic Steel Corp., Cleveland, will be presented the Benjamin F. Fairless Award on Feb. 17 at the annual meeting of the American Institute of Mining, Metallurgical & Petroleum Engineers. Mr. White will be honored for "the fact that his ability, energy, and determination in starting the top-pressure blast furnace and foresight in providing it with prepared burdens have created the world's dominant metal producing furnace." The award, established in 1954 by U. S. Steel Corp., recognizes achievement in iron and steel production and ferrous metallurgy.

## UAW Official Charges 'Racketeering' Employers

Emil Mazey, United Autoworkers secretary-treasurer, in a letter to Senator John F. Kennedy (D., Mass.), charged that more than $32 million has been stolen from workers' pay envelopes by "racketeering, crooked employers" since 1958. Calling for public Senate hearings to examine employers, plus revision of the Fair Labor Standards Act, Mr. Mazey said the money was taken by employers who ignored the act's provisions for minimum wages and overtime pay.

## Plastics Industry Shoots for 15% Production Hike

Look for the plastics industry to produce a record 6.4 billion lb of raw materials this year (vs. 5.6 billion last year and 4.5 billion in 1958), estimates the Society of the Plastics Industry Inc. The industry will expand its capacity nearly 25 per cent. Two plastic materials—polyethylene and vinyl—passed the 1 billion lb production mark for the first time last year.

## Straws in the Wind

Major farm equipment manufacturers are boosting prices of tractors and implements 2 to 3 per cent (sans official announcements); they may be bumped again when steel prices advance . . . New contracts with the steelworkers' union last week averted a strike at Alan Wood Steel Co., returned striking workers at McLouth Steel Corp., and ended a contract extension at American Steel Foundries . . . Pennsylvania Railroad increased its piggyback trailer fleet to 850 units with the purchase of 100 van trailers from Fruehauf Trailer

Co. . . . Labor Secretary James P. Mitchell is reported to favor boosting minimum wages to $1.10 or $1.15 and is urging the White House to head off or veto a Democratic drive for $1.25 . . . Wheeling Steel Corp. will spend $5.7 million in improvements to plants and facilities in West Virginia . . . A contract for the design of a system to enable scientists to catalog and compute satellite orbits was awarded to the Aeronutronic Div., Ford Motor Co.

## Engineers Are Trained, Then Hired

Engineering students who work summers for the Kearfott Co. Inc., Little Falls, N. J., are offered correspondence courses from the company while they are in school. The lessons, concerning everyday situations at Kearfott, consist of a text, a bibliography, and exams. Two benefits: The students and the company have a better chance to evaluate each other, and postgraduation training time is cut by one-third. Of 23 students taking the course, 18 have joined the company permanently.

## Materials Management Concept Gathers Steam

More and more companies are looking into the possibilities of the materials management concept: Establishing one responsibility for providing the right materials in the right quantity and quality at the right time at minimum cost (including transportation, inspection, storage, and delivery to point of use). Last week, STEEL attended a materials management seminar sponsored by American Management Institute, Cleveland. Among our impressions: The concept makes good sense . . . is challenging . . . will permit much better control of inventories, minimize buck passing, permit better control over mounting material costs.

## Russia Trails U. S. in Electricity Production

At least one technological gap in our favor, the commanding lead the U. S. has over Russia in electric power production, will yawn even wider by 1965. Charles E. Eble, president of Consolidated Edison Co., New York, told the American Institute of Electrical Engineers: "The latest Russian seven year plan calls for installation of some 60 million kw of capacity between 1959 and 1965, bringing Russia's total to about 113 million kw. According to reliable forecasts, we will have 250 million kw by 1965."

## Metalworking Pulse

**Autos:** A strike at Chevrolet cut into the industry's near record production schedules. It came amid rumors that producers are considering downward adjustments to more nearly match unspectacular sales. **Business Trend:** The latest index figure is 3 points below the record set two weeks earlier. Reasons: A slight cutback in steel production and the Chevy strike. **Steel:** Output was well ahead of the 83.7 per cent rate a year ago.

- **INDUSTRIAL PRODUCTION**

Week ended Feb. 6 . . . . **182†**
Year ago . . . . . . . . . . . . . **160**
Details on Page 93

- **PASSENGER CAR PRODUCTION**

Week ended Feb. 13 **160,000***
Year ago . . . . . . . . . .**115,491**
Details on Page 90

- **INGOT PRODUCTION RATE**

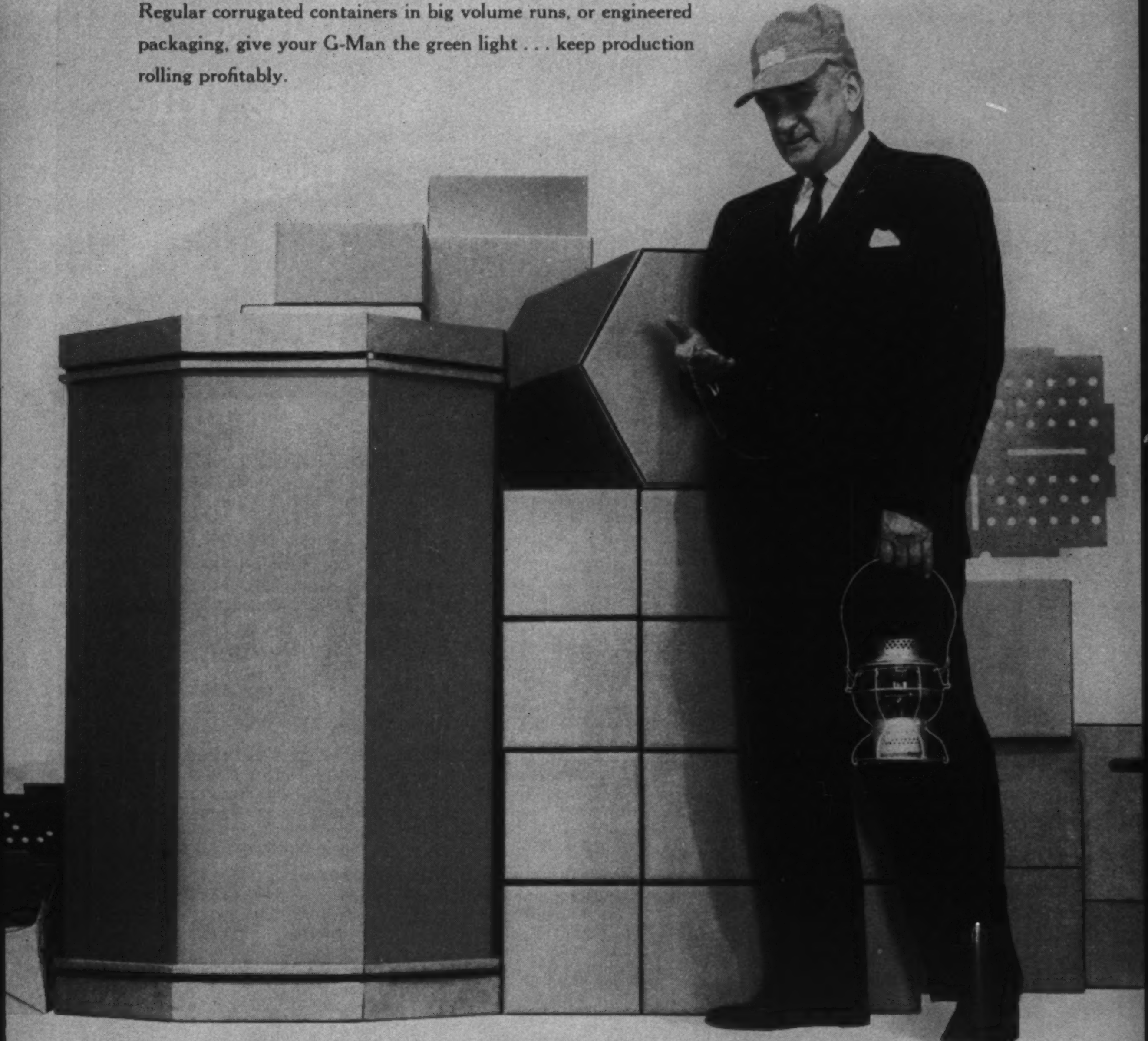
Week ended Feb. 14 . . **94.5%***
Week ago . . . . . . . . . . **94.2%**
Details on Page 166

†Preliminary. *Estimated.

# GAYLORD DEPENDABILITY KEEPS YOUR PRODUCTION ROLLING

You get a clear track to corrugated boxes when you signal Gaylord to start the run. In all lines of industry, Gaylord has a well earned reputation for delivering the packaging . . . so you can package and deliver the goods . . . on schedule.

Regular corrugated containers in big volume runs, or engineered packaging, give your G-Man the green light . . . keep production rolling profitably.



**CROWN ZELLERBACH CORPORATION**
**GAYLORD CONTAINER DIVISION**

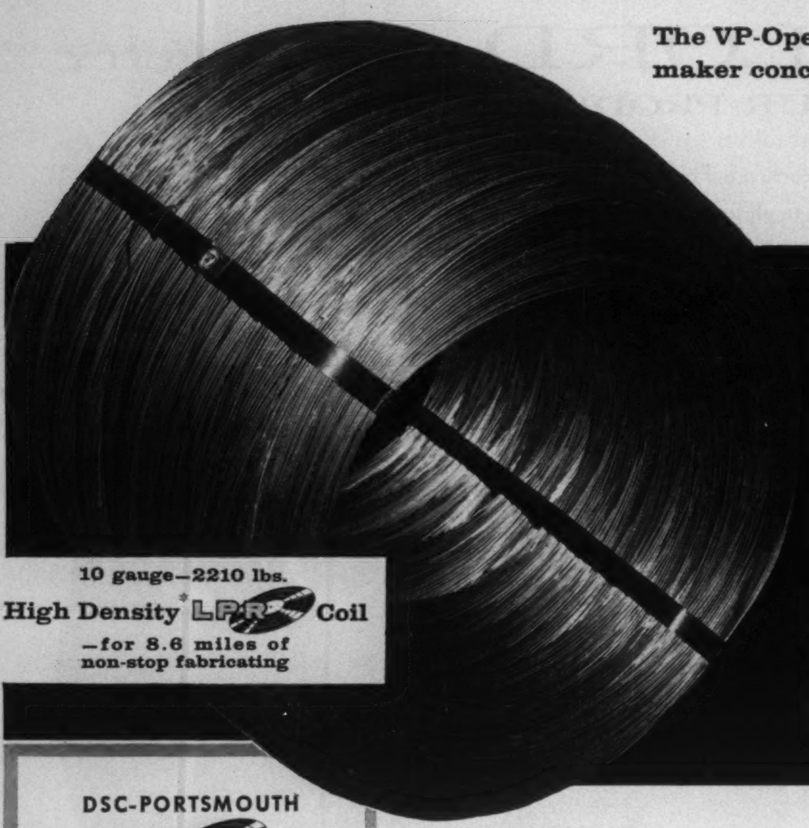
Gaylord Boxes

IN CANADA • CROWN ZELLERBACH
CANADA, LTD. VANCOUVER, B. C.

HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

**The VP-Operations of a big mattress maker concluded:**

*"With *LPR Coils we need set up just once vs. 10 to 15 times with Traditional Size Bundles"*



# How a Brite Wire User Sold Himself

**10 gauge—2210 lbs.**
**High Density *LPR Coil**
**—for 8.6 miles of non-stop fabricating**

## Dyed-In-The Wool Small Coil User

A nationally known mattress maker bought Spring Wire and also Low Carbon Basic Wire in 150 to 200 pound coils. Would he change to bigger coils? Never!

## Then an Eye-Opening Visit

Finally a DSC Customer Rep persuaded the Purchasing Agent to arrange for as many officials as he pleased to visit our Portsmouth Division Rod and Wire Mill. They came—the VP-Operations, the Plant Manager and his Assistant, and the Assistant Purchasing Agent.

## A First Step Toward Cost-Saving

The visitors were conducted through the mill, shown how their wire was drawn in 1200 pound coils which then had to be split into 150 to 200 pound bundles. The visitors conceded they ought to use standard 300 pound bundles "as a starter to cut setup time." *Their* words, not ours.

## A Further Step in the Right Direction

After they had watched our big *LPR's going into Welded Wire Fabric, we showed them about 12,000 pounds of No. 3 Brite Border Wire which had been drawn for them, and was ready for splitting into 60 to 80 small bundles. They caught on—instructing us to change their order to 2,000 pound coils. Next day we shipped them 6 coils weighing 12,055 pounds.

## The Visitors Sold Themselves on *LPR's

Next they spotted a lot of Spring Wire in 2500 to 3000 pound *LPR's ready for shipment to another customer. Said the VP-Operations, buttonholing his Plant Manager, "For every time this *LPR user sets up, we have to stop work and set up 10 to 15 times!" Turning to Uno Johnson, our Rod and Wire Mill Superintendent, he remarked, grinning, "We're sold. Ship us a 2,000 pound *LPR of 10½ gauge Spring Wire so we can start preparing ourselves for handling up to 3,000 pound coils."

DSC-PORTSMOUTH
*LPR
CONTINUOUS LENGTH
BRIGHT WIRE COILS

LOW AND MEDIUM CARBON
.072"/.500" inc. (to about 4200 lbs.)
.023"/.071" inc. (to about 1000 lbs.)

HIGH CARBON
.072"/.250" inc. (up to about 4200 lbs.)
.023"/.071" inc. (up to about 1000 lbs.)

COIL DIMENSIONS
ON REQUEST

●

*A DSC TRADE-MARK

## How About Looking Into *LPR's Yourself?

*LPR's cost no more per pound than traditional mill weight coils. Actually they cost less considering how they help cut your fabricating costs, coil-end scrap loss, materials-handling expense, etc.

For complete information about *LPR's or about visiting our mill, just call your nearest DSC Customer Rep or write to Detroit Steel Corporation, Box 4308, Detroit 9, Michigan.

**Performance Proved DSC®**

**DETROIT STEEL**

**Flat Rolled and Wire Products**

**CUSTOMER "REP" OFFICES**
**IN PRINCIPAL CITIES**

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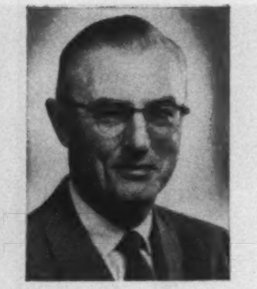


February 15, 1960

# Swimming Upstream

We read (on Page 73) that imports of brass mill products have increased tenfold since 1949. Exports have dropped by two-thirds in the same period. Result: New England mills are working short weeks, furloughing workers, and facing other problems of dislocation.

What has happened in machine tools, fasteners, autos, pipe fittings, sewing machines, stainless flatware, and many other products has been doubled in brass.

Reason: The terrific disparity between labor costs of U. S. manufacturers and their foreign competitors.

That is one of the great problems facing the metalworking industry. It will become more intense before it gets better. We're afraid the problem is not yet appreciated by government, or labor leaders, or the general public.

Like most great problems, low-wage foreign competition has no simple or easy answer. We doubt that proposals for protective tariffs and import quotas, appeals to economic patriotism, or moving plants abroad give us any complete or satisfactory answer. They may be necessary as expedients to gain a little time, but each has it own dangers.

We dismiss as facetious the proposals to export some of our more aggressive labor leaders in a move to accelerate wage increases in other countries and equalize labor costs. To our knowledge, all programs to improve living standards in other lands and thus put their wage levels on a parity with ours are too nebulous and contain too much wishful thinking.

The ultimate solution lies in increasing productivity and in even greater emphasis on research and development to create new products that can compete in world and domestic markets.

That requires greater co-operation from the government. It should encourage industry to re-equip with the most efficient production facilities available.

That requires the co-operation of labor to make the most efficient use of those facilities.

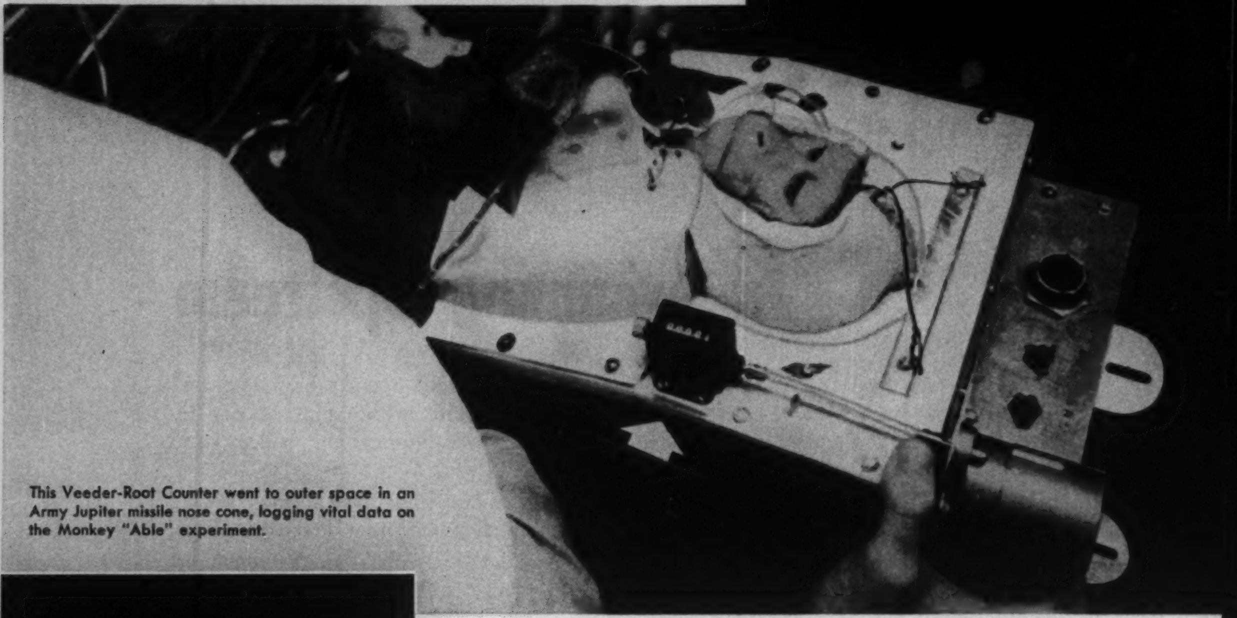
That requires the co-operation of the general public through understanding of industry's foreign competition problem.

Admittedly, the solution is like trying to swim upstream. It's work, but it can be done.

Walter J. Campbell

EDITOR

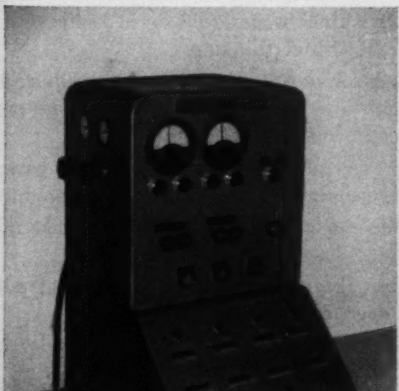
## OPERATION READOUT – One of a Series



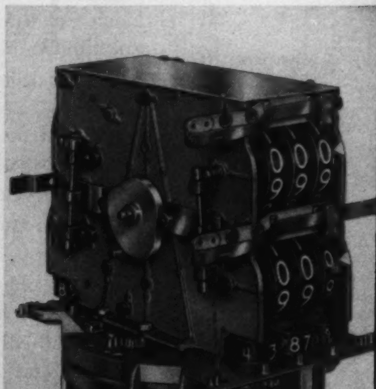
This Veeder-Root Counter went to outer space in an Army Jupiter missile nose cone, logging vital data on the Monkey "Able" experiment.

# Everyone

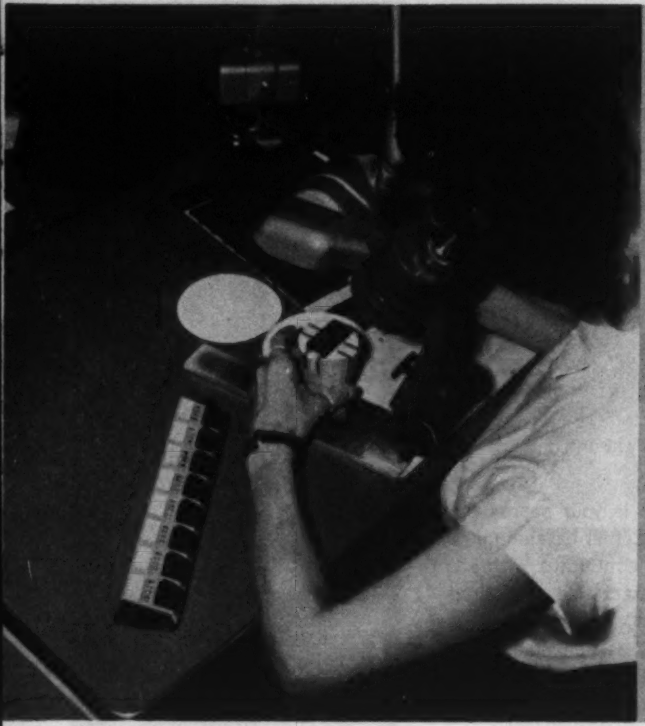
Veeder-Root Counters used as Mileage Recorders provide control data for modern elevator operation. Information is used to plan preventative maintenance, and reduce downtime.

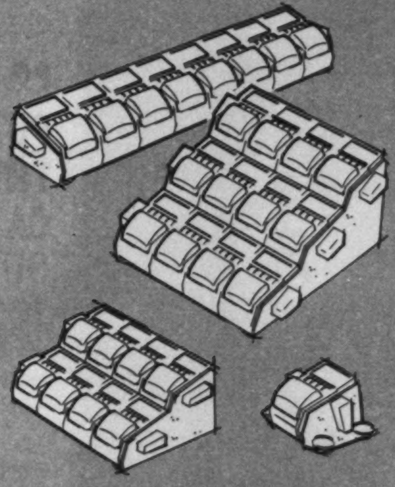


Veeder-Root Electromagnetic Counters give both a continuous and totalized report on tolerances, for this recently developed Taft-Peirce automatic gaging system. Eight different sets of dimensions are recorded.



The "Head for Figures" is this famous Veeder-Root Computing head for gasoline pumps, used the world over. It typifies advanced applications of readout and automatic control.





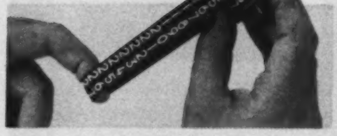
The Veeder-Root VARY-TALLY is a versatile, low-cost reset counter for faster, more accurate hand tallying. Provides positive, easy-to-read record of units, parts, inspection, paperwork, sampling. Available in single units, strips, tiers or any combination.

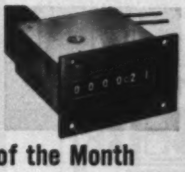
# Counts on Veeder-Root

From outer space to the local gasoline pump, Veeder-Root helps communicate important information. How much? How often? When? How fast? Where? How long? Which direction? What position? . . . all these questions are answered easily, simply, quickly and directly through Veeder-Root's concept of digital communications . . . OPERATION READOUT.

Operation Readout helps you take full advantage of the newest and most advanced counting techniques. It is based on modern uses of Veeder-Root Counting devices, from the simplest type of ratchet counter to the most sophisticated designs of Remote Data Readout, Navigational Counters and Computer-Blender Pump Controls. Through these counters, digital communication and control can provide important advantages in speed, accuracy, human engineering, comprehension and operational control.

**Veeder-Root's "Operation Readout" can help you, now!** Whatever your indication, readout or counting problem, Veeder-Root offers a century of experience in counting engineering. There are over 400 specific models in stock, ready for prompt shipment, or a special counting or readout device can be developed for your application. Contact your nearest Veeder-Root Counting Engineer or write direct.





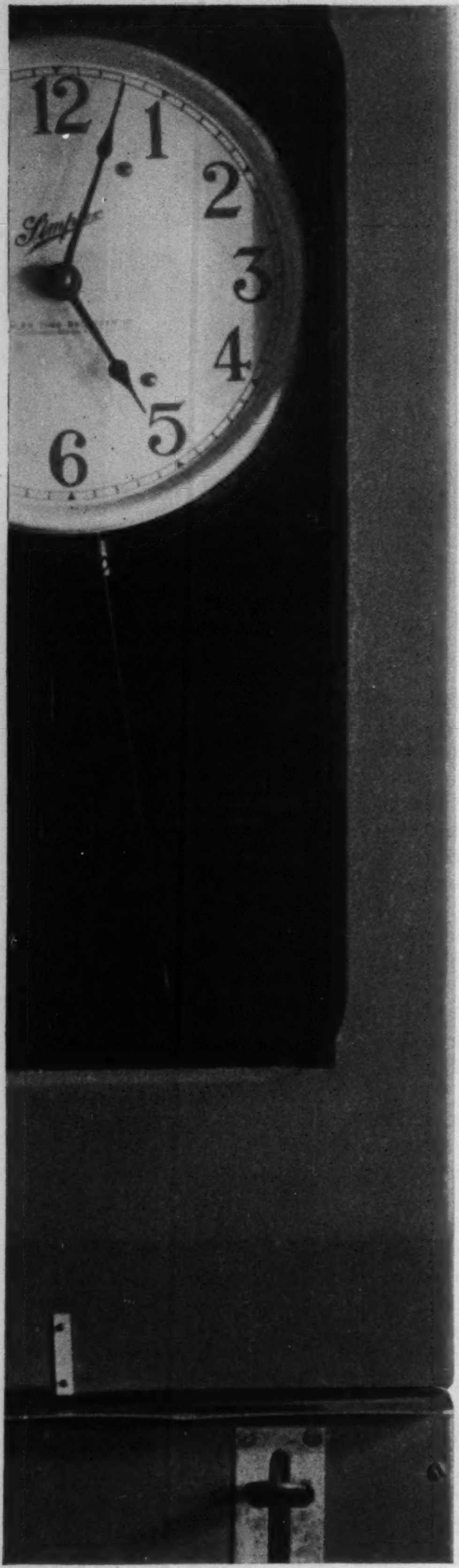
## Veeder-Root Counters of the Month

**New! 360° Tape-Type Bearing Counter** was developed to provide digital readout of angular relationship. Tape greatly reduces size and weight over conventional devices. Adaptable to many indication requirements.

**Series 1591 Quick Reset, High Speed Magnetic Counter** is designed for accurate, dependable remote indication of machine operation, or for counting at high speed. Speed: 3000 cpm, 4 or 6 figures, manual or electrical reset.

**VEEDER-ROOT, HARTFORD 2, CONNECTICUT *"THE NAME THAT COUNTS"***

New York • Chicago • Los Angeles • San Francisco • Seattle • St. Louis • Greenville, S. C. • Altoona, Pa. • Montreal • *Offices and Agents in other principal cities*



"PUT THE CAT OUT, JOE everyone's gone home! No need for overtime to get steel ready for tomorrow's production—we're right on schedule."

Big help is your nearby Steel Service Center backing up production schedules with steel cut to exact size, if desired—delivered right into your plant precisely as needed—eliminating costly in-plant inventory—contributing to your over-all operating efficiency.

Capital tied up in unproductive steel storage, time-consuming cutting, scrap waste, excessive handling, is a thing of the past with manufacturers who take advantage of the services made readily available by their Steel Service Centers. A talk with your Steel Service Center representative could be important to you. He can show you how using his organization and its facilities, is like adding an entire warehouse and its personnel to your operation without investment. Why not call him, today?

STEEL
SERVICE CENTER
INSTITUTE

**...YOUR STEEL SERVICE CENTER**

**INLAND STEEL COMPANY**
INLAND
30 West Monroe Street
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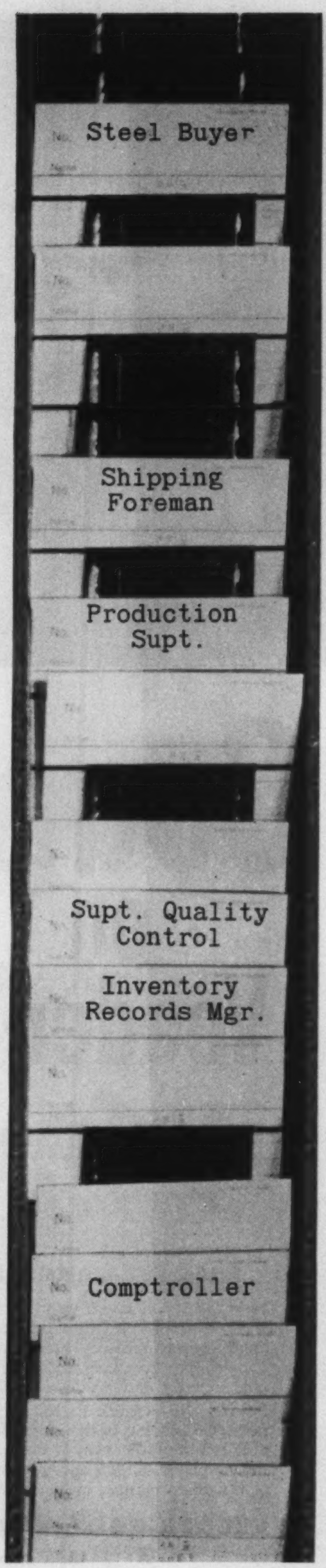
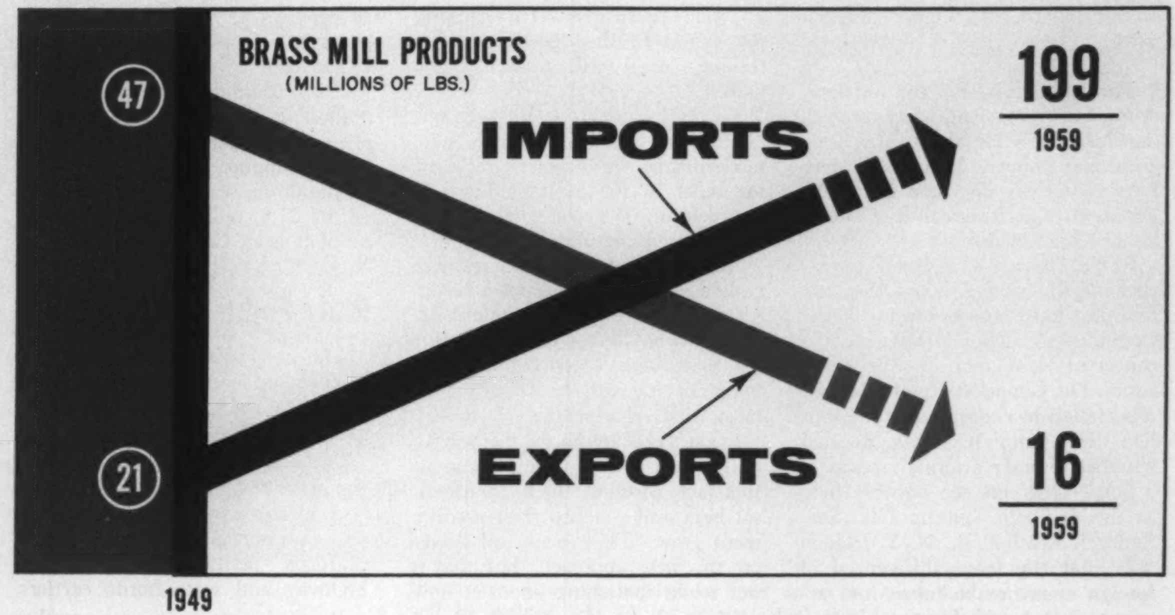

Steel Buyer
Shipping Foreman
Production Supt.
Supt. Quality Control
Inventory Records Mgr.
Comptroller



# 'X' Marks Brass Mills' Problem

IMPORTS of brass mill products—running at better than 10 per cent of the domestic industry's shipments—are expected to set a record this year.

If they do, it'll mark the seventh straight year they've hit a new peak. Imports have dipped slightly only twice, while soaring from 21 million lb in 1949 to more than 199 million lb last year.

The domestic industry's shipments dropped in a jagged curve from 3.6 billion lb in 1943 to 1.5 billion lb in 1958. Last year they rose slightly to 1.9 billion lb.

- **The Contrast**—Particularly perplexing is the fact that the industry has 1 million lb of capacity standing idle while its foreign competitors are booming.

The basic problem is well known—price, created by low wage rates in foreign countries.

A Connecticut mill says it just lost a major customer for brass strip to a German mill because its price is 7 to 9 cents a pound below that of domestic producers.

Another New England mill cites a case where an English concern outbid it 64 cents vs. 81 cents per pound on a large condenser tube order.

**As STEEL went to press last week, a Milwaukee firm announced cuts in prices of tubular plumbing brass of as much as 3¼ cents per pound below what foreign companies are charging. They are 10 to 15 cents per pound below domestic producers' published prices. Other price cuts were expected on a selected product basis to help domestic mills become more competitive with foreign producers.**

In some markets, the bite of foreign competition is considerably deeper than the over-all industry average. For example, foreign producers are winning about 25 per cent of the domestic brass tubing market.

"It's impossible to meet this type of competition," says Pierce M. Welpton, president, Bridgeport Rolling Mills Co. "We're trying our best to reduce costs, but we can't compensate for the much lower labor rates prevailing in other countries."

In commenting on the continuing pressure of union leaders for higher wages, one company executive estimates that "every 35 to 40 lb of imports cost U. S. labor 1 manhour."

What's the answer? Even among the brass mill officials there's little unanimity. Some see tariffs and quotas as the best immediate measure. Most are stepping up research and development programs to counter foreign imports and to stem the loss of markets to competing materials. Practically all are modernizing plant and equipment as rapidly as possible to gain higher productivity.

• **Tariff Outlook**—For the last four years, bills proposing tariff protection have been tossed into the Congressional hopper. Industry leaders have repeatedly discussed the problem with the Business & Defense Service Administration.

BDSA officials have listened sympathetically but point out that the first plea must be made to the Tariff Commission. The industry lacks a concerted campaign on the tariff issue. The Copper & Brass Research Association has considered the problem but states it hasn't decided whether to make a formal appeal.

Some observers see possible help in the proposed Keating Bill (Sen. Kenneth Keating, R., N. Y.) which asks that the wage differential of foreign countries be taken into account when establishing tariff rates.

• **Equipment Needed**—"Technologically, I think we're behind the European producers of copper and brass mill products," laments one official. "Let us not kid ourselves. About all we can do is make our manufacturing and processing methods more efficient. There's no question in my mind that a reduction in the spread between material prices and finished goods prices is coming. We'll have to learn to live with it."

Says an Eastern mill executive: "Before we can do too much more modernizing, we've got to get some tax relief in the form of depreciation reform. We won't have profits enough to accomplish the job."

Productswise, some of the research and development dollars are beginning to pay off. One example: Wolverine Tube Co.'s recent marketing of its Strubing, a collapsible tubing material that can be formed from most nonferrous metals.

STEEL's check with the major brass mill industry executives pointed up this fact: Most of them admittedly sat back and watched their predicament grow. They're not all agreed on the best approach, but they're out to do something about it now.

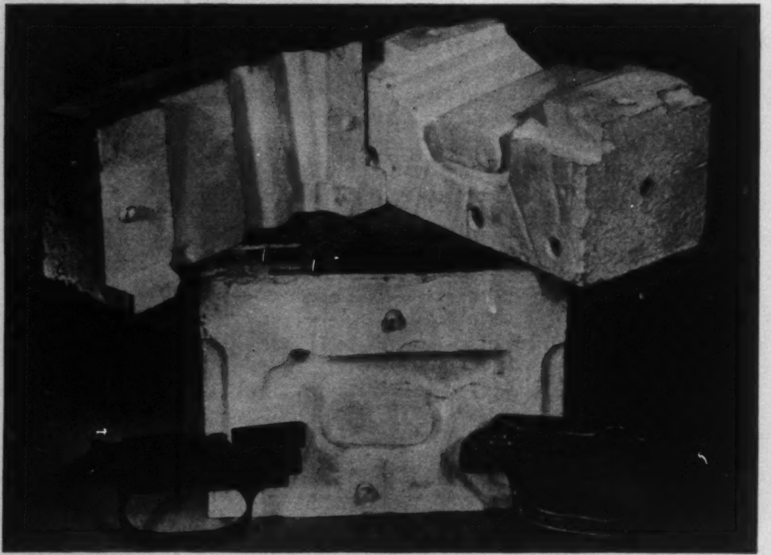
## Aluminum Imports Climb

Imports of aluminum semifabricated products into the U. S. last year increased 80 per cent over 1958's, reports the Business & Defense Services Administration.

Belgium was the chief supplier of items like plates, sheets, bars, rods, and circles and accounted for 28 per cent of the 101.5 million lb imported. Japan was second with 11 per cent.

Crude aluminum imports hit 479 million lb, 12 per cent of domestic primary production. Canada is the largest supplier.

Aluminum scrap imports amounted to 21.8 million lb, practically all of it from Canada.



**TITANIUM AND ALUMINUM CASTINGS** are poured in the same mold at Niforge Corp., Boston. Anodized aluminum molds are used in the Parlanti process, which insures regulated chilling of molten metal by controlled heat transfer. Said to have better than normal tensile strength and ductility, the castings are made for Winchester-Western Div., Olin Mathieson Chemical Corp., New Haven, Conn.

## Rails Fight to Diversify

The goal of railroads seeking to diversify into other modes of transport: A one package concept of freight hauling by a single agent.

Legislation pending in Congress would remove restraints that prevent surface carriers from operating air transportation and handicap railroads petitioning to operate highway and water-borne carriers.

Permission to enter into another field would be granted subject to approval of the Interstate Commerce Commission or the Civil Aeronautics Board after proof that the move is consistent with the public interest.

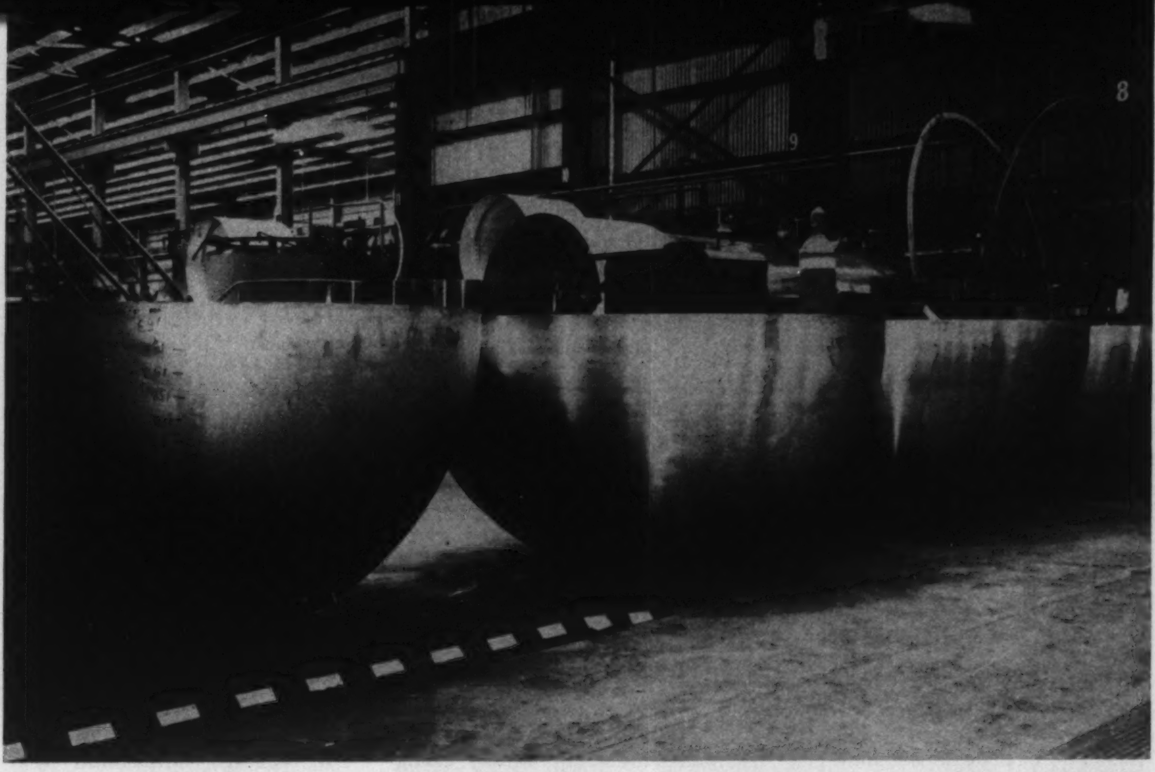
Under present law, railroads cannot engage in air operations. They can operate inland waterway service upon a special showing. Interstate trucking is limited to rights existing prior to the Motor Carrier Act of 1935 and "unusual circumstances."

• **Railroads claim airplanes, trucks, barges, and trains are only tools of the trade.**

Selection of a particular mode of transport is no longer limited to the nature of the freight itself. Economy and efficiency determine whether the carrier will be truck, rail, barge, or a combination of them, emphasize rail officials.

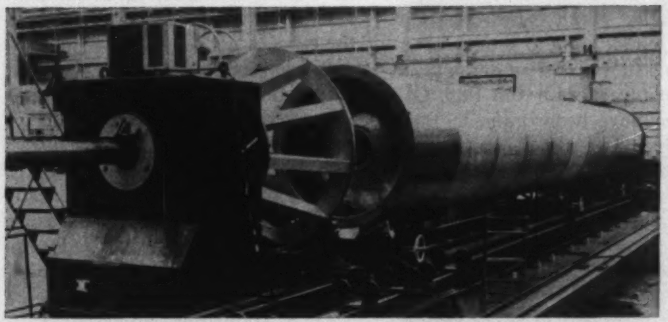
• **Diversification would provide the shipper a complete service under one management.**

It would also help to alleviate a long standing grievance of railroads: The use of public funds (partially contributed by the railroads in the form of taxes) to help build highways, airways, airports, and to improve waterways for use by their competitors.

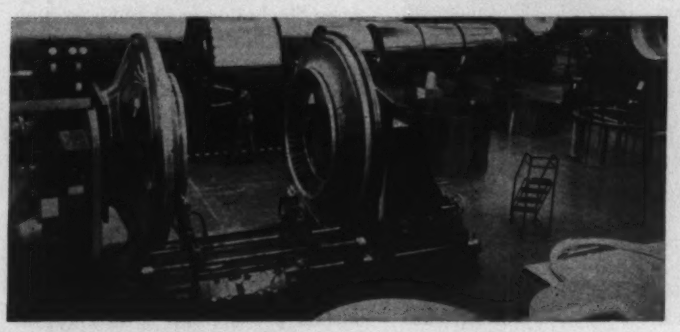


These spun aluminum bulkheads, lined up at the Army Ballistic Missile Agency, will be welded into 70 in. diameter fuel tanks to power the Saturn booster

# U. S. Saddles Up Its Moon Bound Charger



Saturn fuel tanks, 70 in. and 105 in. in diameter, are constructed at Redstone Arsenal's fabrication and assembly engineering laboratory



In this metalworking fixture, aluminum skin segments are trimmed to insure precise alignment when tank sections are welded

A COLOSSAL ROCKET engine designed to power manned flights to the moon and for exploration of space is taking shape at the Army Ballistic Missile Agency, Huntsville, Ala.

The massive engine, which will be used in the National Aeronautics & Space Administration's project Saturn, is rated at 1.5 million lb thrust, more than four times as powerful as today's ICBM boosters. Saturn's booster will consist of eight H-1 liquid propulsion units (linked to fire simultaneously) clustered around a Jupiter intermediate range ballistic missile. Hundreds of tons of liquid oxygen fuel will be carried in the Jupiter and in eight modified Redstone missile tanks encircling the Jupiter.

Each of the eight H-1 engines, produced by Rocketdyne Div. of North American Aviation Inc., will pump its own fuel to develop 188,000 lb of thrust.

Some 11 tons of aluminum alloy 5456, supplied by Aluminum Co. of America, will be used in the outer skin of Saturn's fuel tanks.

**Conveyors, mail sorting devices, canceling machines, handling equipment — the Post Office Department is seeking nearly $80 million worth of such equipment in fiscal 1961 for its modernization program.**

# Post Offices: $500 Million Market

MAKERS of material handling and automated equipment can look to the U. S. Post Office Department for more business as its modernization program shifts into high gear.

**• In fiscal 1961, the department is asking Congress for $80 million specifically obligated for modernization.**

Almost $6 million of that money will go for contract research and development of prototype equipment. Over $70 million will be used to equip 19 new post office facilities and one present facility with the most modern mechanical and automatic mail sorting and distributing equipment. The department's regular capital equipment program will amount to about $68 million, which will be spent to replace standard machines with the latest models and modernize 150 post offices.

About 14,000 post offices will be built in the next few years. Many of the 37,000 present ones will be modernized. The $80 million modernization program in fiscal 1961 is a part of the over-all $500 million equipment program authorized in 1958 by Congress. With the rapid increase in mail volume expected in the next 15 years, it is certain that more money will have to be spent on modernization after the authorization is used up. Like the vast federal highway program, the post office program seems certain to remain a continuing important source of business to metalworking.

**• Many firms are already doing business with the Post Office Department. Here is a partial list:**

Pitney-Bowes Inc., Stamford, Conn., has facer-canceler machines in Washington; others are being installed in Philadelphia and Detroit. The machines eliminate many man-hours of letter handling and are said to be paying for themselves in one year.

Burroughs Corp., Detroit, has built a semiautomatic letter sorter which was developed under a $1.9 million contract with the Post Office. Ten have been ordered. Burroughs has recently forwarded its bid to build 20 more of the machines. A number of other companies have also bid.

An Amsterdam, Holland, firm, Werkspoor, N. V., builds the Transorma letter sorter, which has been in use for two years at Silver Spring, Md.

A Belgian company, Bell Telephone Mfg. Co., has installed one of its sorters in Washington.

An optical scanning device which reads addresses automatically (it handles 20 cities) has been built by Intelligent Machines Research Corp., Alexandria, Va., a division of Farrington Mfg. Co., Needham Heights, Mass. The Post Office Department has a contract with Farrington for research into reading handwritten addresses.

Jervis B. Webb Co., Detroit, built a semiautomatic machine that sorts parcel post.

In Chicago, Mechanical Handling Systems Inc. of Detroit has built a conveyor to receive mail sacks, then deliver them to the culling table.

Food Machinery & Chemical Corp. is mechanizing the new Oakland, Calif., post office (Project Gateway). The department describes the project as a laboratory in which machines and methods will be tested under working conditions.

International Telephone & Telegraph Corp.'s Intelex Systems Inc. has a contract for Project Turnkey at Providence, R. I. To be finished this fall, it is being hailed as the world's first fully mechanized postal building. Many suppliers are (or will) participate with I.T.&T. and Food Machinery in the Turnkey and Gateway projects.

U. S. Industries' Robodyne Div., Silver Spring, Md., is developing a line of automatic post office equipment, including mail tying, sorting, and distributing machines.

**• Aerojet-General Corp.'s Atlantic Div., Frederick, Md., reports it is ready to use experience it gained in Post Office research and development work in an allied field: Mailbag sorting in railroad terminals.**

It is discussing its system with several railroads and has made a formal presentation to the Association of American Railroads.

The company has bids to install

its sorting system in the Cleveland Post Office. A breakdown of the costs in a typical Aerojet system gives a good indication of where metalworking firms can look for subcontracts in post office modernization. Aerojet says it would subcontract 50 per cent to 60 per cent of the contract. Costs are:

| | |
|---|---|
| Engineering | 23 per cent |
| Memory control (electronics) | 9 per cent |
| Conveyors | 47 per cent |
| Diverters and structures | 21 per cent |

**• What does it take to construct a modern post office?**

Washington's post office required more than 6 miles of power driven conveyors, 330 tons of structural steel, and hundreds of pieces of equipment, including a 2400 ton air conditioning system.

Concepts under consideration by the department include self-service post offices, money order issuing machines, and closed circuit television as an aid in internal security.

Decisions on equipment are made by the department's Office of Research & Engineering in Washington. It oversees subcontracting by major contractors on big projects. The problem in a nutshell: How to absorb an ever increasing load of mail without raising the department's costs. The answer seems to be more equipment: Employment in the Post Office increased only about 6 per cent from 1953 to 1958, despite an 18 per cent increase in mail volume. "It is now apparent," says the department, "that any further substantial manpower savings can be achieved only through mechanization and improved plant facilities."

**• It is difficult to predict how fast the Post Office's program will grow because of the vagaries of Congress.**

Originally, the $500 million program was a five year plan, but it appears that its span has been stretched out about 20 per cent.

"As the program develops, our equipment requirements will grow," assures one department official. "We have just scratched the surface by taking care of some of the major bottlenecks so far."

Competition for the business is keen: For example, six conveyor manufacturers and 12 makers of control equipment may bid on one contract. In letting contracts for major facilities, the department looks for a firm capable of getting the best subcontractors.

**• Firms which get into the program will be in a good position to gain other business from derivative types of work, as Aerojet is attempting to do.**

That firm has survey teams evaluate new jobs on the basis of fully integrated systems. Obvious places to further automate include railroad and airplane terminals and grocery warehouses. Installation of an Aerojet system in a railroad terminal might cost $500,000, yet the system could pay for itself in less than two years. So it seems certain that the market for such equipment will continue to expand for years.

**Built by Burroughs Corp., this machine can sort 36,000 letters per hour with 12 operators**

**On the back of the sorter, letters are received in 279 destination bins. Signal lights flash when bins are full**

**Decorative applications continue to provide the most business, but . . .**

# Vacuum Metallizers Strive For More Functional Uses

## It's area of greatest potential. Among present uses and possibilities: Coatings for high strength steels, electronic parts, deposition of refractory materials

FINISHERS will do a $100 million business this year in vacuum metallizing of parts and sheet materials.

That's the prediction of F. J. Stokes Corp., Philadelphia, a builder of metallizing equipment. It represents a record high dollar volume, says the company. Main reasons for the upsurge: 1. Continuing growth of batch finishing applications. 2. Intense interest of paper and steel manufacturers in semicontinuous and continuous metallizing of sheet materials.

Recent technological advances in equipment, as well as in plastics and organic coatings, are causing manufacturers to take a closer look at the method through which they can replace heavy, expensive metal parts with strong but light plastics that look like metal.

Vacuum metallizing got its start commercially in 1935 in coating lenses for reflection control. It turned up in the automobile field in the early 1950s.

**• Today, it's being used to coat glass, paper, and plastics with a thin metal film for decorative uses in autos, appliances, toys, and hundreds of other products.**

Functional applications are just getting underway. But it is in that area where the large volume industrial uses will come about, thanks to research that is overcoming earlier handicaps.

Most decorative metallizing is done by custom finishers in batch type operations. Several hundred finishing shops throughout the country have one or more metallizing chambers.

In the batch process, articles are placed in a vacuum chamber after they have been coated with a resinous material. Aluminum, or other metal, is vaporized and allowed to condense on the parts in the vacuum. Parts are removed and a resinous coating is applied over the metal film. A typical metallized coating is usually four to eight millionths of an inch thick.

Semicontinuous coating is now used for rolls of paper or plastic film, but automakers are searching for ways to coat parts at higher production rates.

**• Vacuum metallizing creates intriguing possibilities for auto stylists.**

It can be applied in varying brightnesses and textures and can be colored to simulate gold or to match the hue of the upholstery. When the strength of metal isn't required, vacuum metallized plastic makes possible significant savings in cost and weight.

The technique largely used by automakers has been second-surface metallizing. The film is condensed on the back side of an object made of a clear material and viewed through the material.

First-surface metallizing, in which the film is attached to the outside surface of the object, is considered to have the brighter future because it permits the use of many other stronger, opaque plastics, as well as metal stampings and diecastings.

Automakers are having their troubles in getting the finish they want on metallized parts. One company says the method causes some deterioration of the epoxy resins that are being used. Other problems: Parts must be extra clean because small particles of dirt or dust show through as blisters. The slow cycle time in the batch system runs up production costs.

Another automaker is attempting to improve its batch method by more closely controlling atmosphere in the chamber so it can cool faster and make more shots. But the company feels it can't make a big breakthrough until a continuous process is developed.

**• Aside from decorative applications, much progress is being made in functional vacuum coatings.**

Most of the research is being done by equipment builders such as F. J. Stokes Co.; National Research Corp., Cambridge, Mass.; Consolidated Electrodynamics Corp., Rochester, N. Y., and Kinney Pump Corp., Jamaica Plain, Mass.

The vacuum process may solve the problem of coating high strength, aircraft steel with corrosion resistant cadmium. Electrolytically deposited cadmium causes hydrogen embrittlement and failure under stress in the high strength steels. Cadmium films 0.3 to 0.5 mils thick can be deposited in vacuum with no embrittlement.

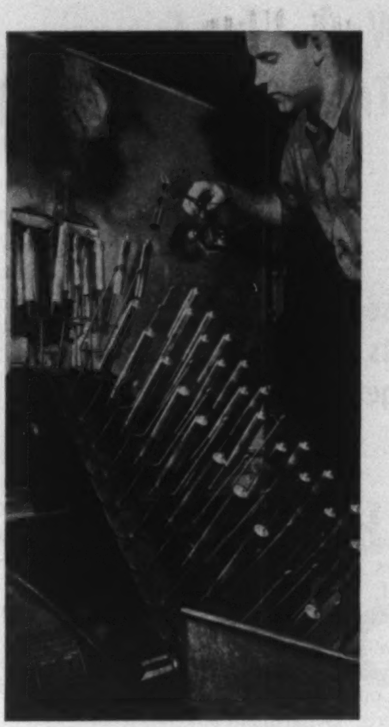
Manufacturers of capacitors, potentiometers, and resistors are using the method. It may be the key to the ultrasubminiaturization of electronic components. It may become possible to deposit capacitors, resistors, and other circuit elements as well as lay down the entire circuit in a vacuum metallizer.

Vacuum metallizing has been largely responsible for the development of electroluminescense as a lighting method. The lighting panels are made by spraying glass with a conductive transparent coating, then applying a layer of phosphors followed by deposition of aluminum and another layer of conductive material. The phosphor layer gives off light when an electric current is passed through it.

National Research Corp.'s process permits deposition of thick films of aluminum or cadmium (up to 0.004 in.). That opens up new possibilities in corrosion resistance for auto bumpers and bumper guards, as well as aircraft parts and even bolts and nuts. Deposits are strong, ductile, and nonporous, and do not affect the tensile strength of the base metal.

An extension of the vacuum metallizing technique has been the deposition of refractory metals such as tungsten, chromium, and molybdenum. Developer of the process, Alloyd Research Corp., Watertown, Mass., says electronics and missile people stand to benefit first. Possibilities include plate elements for radio tubes, and tubing for high temperature areas in missiles.

# Squeeze Tubes Set Record



MAKERS of collapsible metal tubes, fresh from a record year, expect to squeeze out even higher production in 1960.

The 16 producers of such familiar items as tooth paste and pharmaceutical dispensers turned out an estimated 1.14 billion tubes last year, an increase of 13 per cent over 1958 production. Industry prospects throughout the sixties are equally bright. By merely hanging on to established markets, producers will be able to expand output in pace with population growth and mounting industrial activity. The tubemakers' prime industrial markets include containers for adhesives and lubricants.

Broad consumer acceptance has boosted the squeeze tube's use as a container for a wide range of medical, household, and food products. The tooth paste industry accounts for more than a half billion tubes a year.

**• Tubemaking**—Metal slugs, or blanks, are impact extruded into a one-piece seamless container with a plain or embossed shoulder and neck at one end and open at the other. After filling, the tube is trimmed to length, and the neck is threaded and faced.

**• Modern Metals Compete**—Basic design has been relatively constant, but today's tube metallurgy has come a long way since the pure tin or white metal composition a century ago.

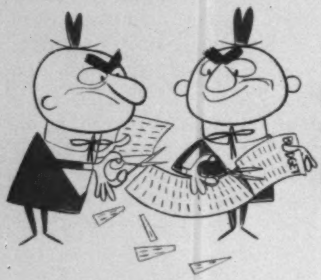
Aluminum tubes are the biggest sellers today. Developed commercially in the U. S. by Aluminum Co. of America, aluminum tubes have risen from 5 per cent of industry volume in 1945 to 60 per cent of current production. Metal usage for tubes breaks down this way: Aluminum, 58.8 per cent; lead 28.6 per cent; tin, 9.6 per cent; tin-coated lead, 1.9 per cent; and tin-lead alloy, 1.1 per cent.

Other industry advances have broadened the markets for collapsible metal tubes. Some landmark steps: Development by Peerless Tube Co., Bloomfield, N. J., of the mastitis tube, which enables dairy farmers to administer antibiotics to their cattle, and the syrette, a one-shot hypodermic tube, which saved lives in both World Wars. Other developments: Product inhibitors and interior tube coatings prevent reaction between the packaged product and the tube metal, making it possible to package many of today's "wonder" drugs.

The industry has also had some market setbacks. Plastic tubes and containers, and more recently, aerosol containers, have invaded some solid tube markets, but the impact of plastics and spray cans is hard to measure in the constantly growing metal tube market. (One example: Introduction of electric shavers and aerosol packages for shaving cream cut this once important tube market more than 50 per cent by 1957.)

Makers of metal tubes cite improved, automatic manufacturing methods as a prime market edge. White Metal Mfg. Co., Hoboken, N. J., says the unit cost of collapsible tubes is slightly lower than it was ten years ago, despite higher material and labor costs.

# Economy Bloc at Work...Tax Extension Needed to Insure Budget Surplus...Treasury's Report on LIFO Expected Soon



## House Committee Starts Shearing Budget Requests

HEADLINES from Washington these days emphasize the possibility of substantial increases being made in the President's budget for fiscal 1961, yet behind the scenes a few Congressional committees are doing their best to cut back the President's program by at least $2 billion.

So far, the House Appropriations Committee has cut about $40 million from the Commerce Department's appropriations, including $23 million from the programs for the Maritime Administration, $1 million from Census Bureau funds, $7 million from funds for the National Bureau of Standards, and $10 million from the Weather Bureau's request. Funds for the Small Business Administration have been cut by about $10 million.

The action must be approved by the House and the Senate.

## Defense Expansion Will Be Small

While various top Pentagon officials are telling Congress of their needs for more money to close the missile gap, powerful forces on Capitol Hill continue their efforts to hold the Defense Department's budget close to the $41 billion ceiling established by the President. Rep. George H. Mahon (D., Tex.), chairman of the House Defense Appropriations Subcommittee, is one.

In the past, Congress has usually agreed with Representative Mahon's estimate of the defense posture and this year should prove no exception. At the most, he seems willing to add about $300 million to the Pentagon's budget to permit the Strategic Air Command to keep some of its bombers constantly in the air, but he has warned that Congress should find some place to cut that same amount from the defense budget.

Metalworking will be interested in SAC's air alert plans because much of the funds will go for the buying of spare aircraft parts, including a substantial jet engine program.

The Navy's call for six more Polaris submarines has been echoed by Rep. Clarence Cannon (D., Mo.), House Appropriations Committee chairman, but the congressman has maintained a similar position in past years. He has always been unhappy with the Navy's continued interest in building aircraft carriers rather than submarines. If Congress does follow the Navy's request, chances are that the only money available in fiscal 1961 will be for long leadtime items, rather than a full building program for six more Polaris subs.

The Air Force has pretty successfully killed chances for an expanded Atlas or Titan program by pointing out that additional birds ordered now would not be ready until our second generation ICBM, the Minuteman, is ready—so why order the old model?

Pleas by the Army for more money to expand its modernization program may attract some interest on Capitol Hill, but White House reluctance to spend any more money on the Army will most likely cause any additional funds passed by Congress to be frozen at the Bureau of the Budget.

## LIFO Report Due Momentarily

Industry is anxiously awaiting delivery of a Treasury Department report on H.R. 6014 to the House Ways & Means Committee. The bill calls for relief to businessmen with respect to the involuntary liquidation of LIFO (last in, first out) inventories during the steel strike. Rep. Noah Mason (R., Ill.) introduced the measure to allow taxpayers to recalculate their 1959 income on the basis that they had been able to replace their base inventories in 1959.

Ways & Means plans to schedule hearings as soon as Treasury reports its feelings about the bill.

## Barbed Wire Tariff Hearings Set

Following the U. S. Court of Appeals decision which requires the Tariff Commission to investigate the effect of imports on domestic producers of barbed wire, the commission last week set May 10 for public hearings. It has already turned down appeals from domestic nail producers. Outlook: Barbed wire will fare no better than nails.

## Tax Extension Is Urgent

Treasury reports present tax rates on corporation profits and certain excises (scheduled to expire June 30) must be extended to give President Eisenhower any budget surplus for fiscal 1961. If not extended, the $2.7 billion revenue would be lost in the fiscal year.

LOWER "COST PER TON" — designed into every

MORGAN Rolling Mill

Today's Mill has to be designed for tomorrow's economy—if it is to successfully compete in the cost and quality race of the coming years.

Improve the product, reduce the cost, do it faster—these are all prime requirements of American Industry—and Morgan know-how has some tangible answers to these demands.

Young engineers with ingenuity, tempered by the experience of older men, bring the greatest advances in Rolling Mill performance to bear on *your* problem.

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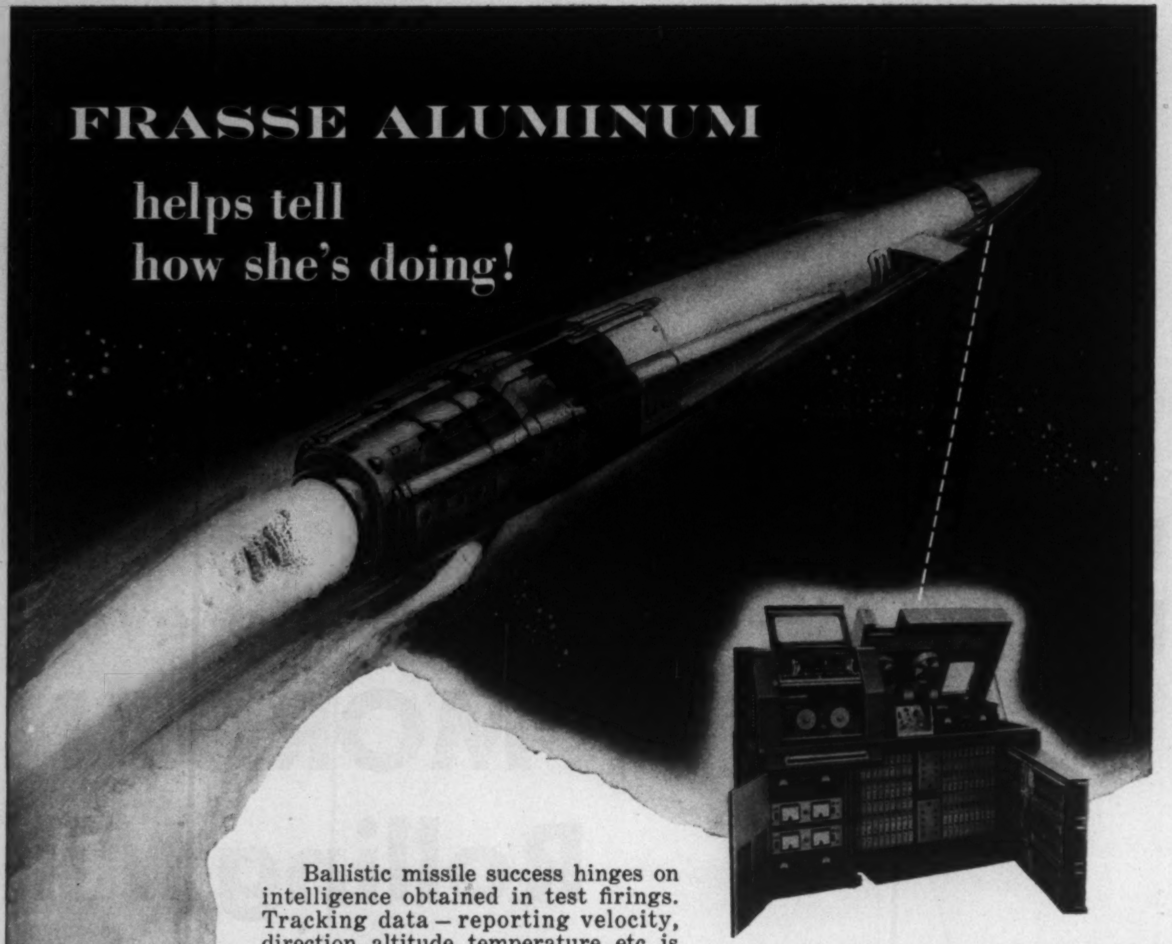
# FRASSE ALUMINUM

## helps tell how she's doing!



Ballistic missile success hinges on intelligence obtained in test firings. Tracking data – reporting velocity, direction, altitude, temperature, etc. is vital – when processed, it guides critical design changes.

Heart of the intricate data processing system at Cape Canaveral is a Potter Magnityper – a high speed electronic printer that decodes raw material . . . then stores, collates, interprets and prints at 72 *thousand* characters per minute. Lightweight, non-magnetic aluminum is essential to its efficient operation – that's why the Magnityper is made almost completely of Frasse aluminum.

Frasse ships the required sizes quickly from stock – in the grades that contribute to its ease of fabrication *and* performance. For example, Frasse supplies 2024-T4 bars for *strength* and *machinability*, 5052-H34 sheet for *formability* and *weldability* and "775" tooling plate for *dimensional accuracy* with *no distortion when worked.*

Perhaps these same qualities can increase the efficiency of *your* product – or reduce fabricating costs. It's worth investigating – and a Frasse aluminum specialist will be glad to help. There's no obligation – simply write or call your nearest Frasse office. You'll be glad you did.

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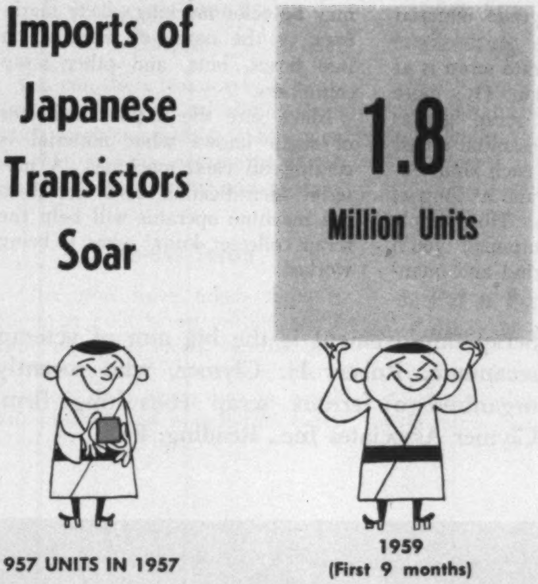
# Americans Invest in Japanese Electronic Companies... British Steel Production Turns Up... Aussies Slap U.S.



## Japanese Firms Assault U. S. Electronic Market

WHILE the Electronic Industries Association is attempting to convince the Office of Civil & Defense Mobilization that electronic imports from Japan "threaten to impair the national security," the Japanese continue to capture a larger share of the U. S. market. Two reasons: Labor costs are as little as one-fifth of those in this country; product quality is good.

The transistor situation has been particularly dramatic. In 1957, Japanese imports came to only 957 units; in 1958 the figure was 10,620. In the first nine months of 1959, the total spiraled to 1,828,341. During the period, nearly 2.5 million radios (with three or more transistors) were imported vs. 1.2 million in all of 1958. More than 1.1 million one and two transistor radios were imported.

Among those leading the influx is Toshiba (Tokyo Shibaura Co. Ltd.), which sold about 500,000 transistors here last year. Value: $10 million. 1960 goal: $15 million. The company recently completed an agreement with Cornell-Dubilier Electric Corp., South Plainfield, N. J., to market its transistors, diodes, and other semiconductor products in this country.

Toshiba is capitalized at $70 million. The 85 year old firm is Japan's largest electronic manufacturer and second largest company in heavy industry. Employing 40,000, its 20 factories turn out an endless variety of products, ranging from tiny transistors to giant locomotives and generators weighing over 100 tons. Toshiba produces 1.1 million fluorescent tubes and 6.8 million electric bulbs monthly. Total annual sales: $300 million.

The company's two research laboratories, staffed with 767 engineers and technicians, have come up with 1131 patents in the last few years.

International General Electric Co. is a major stockholder. Toshiba makes transistors and other electronic components for IGE to sell outside U. S. and Canadian markets. Among the Japanese firm's 51 subsidiaries are Toyo Otis Elevator (Japan) Ltd.; Ray-O-Vac (Japan) Ltd.; Nippon Remington Univac Kaisha Ltd.; and Shibaura United Engineering Co.

Several other American firms have investments in Japanese electronic companies. Westinghouse Electric Corp. has an interest in Mitsubishi Electric Mfg. Co., which makes radio and television sets under Radio Corp. of America licenses and transistors as a Western Electric Co. Inc. licensee. International Standard Electric Corp., an International Telephone & Telegraph Corp. subsidiary, has 21 per cent ownership of Nippon Electric Co. Sylvania Electric Products Inc. is 10 per cent owner of Shin Nippon Electric Co., a partially owned subsidiary of Nippon Electric.

## British Steelmakers Set Fast Pace

British steel production in 1959 was 22.6 million tons against 22 million in 1958. Current output is running at the rate of 26.3 million tons annually.

The shipbuilding industry, after a long period of depression, seems to have finally turned the corner. And the railroads are beginning a vast modernization program which includes main line electrification.

## U. S. Labeling Bothers Aussies

Some Australian steel, sold to the U. S. Department of State and then sent to foreign lands under U. S. foreign aid, is being shipped without identifying its place of manufacture, charge certain Australian sources. Example: 10,000 tons of Australian steel billets recently arrived in Karachi, Pakistan. The only identification: The U. S. flag, a pair of clasped hands, and the words, "The United States of America."

# How to Get the Most Out of Your Scrap

**A good disposal program can add to your revenue, "clear the decks" for more efficient production, cut down on space waste, and reduce accident hazards in your plant**

YOUR SCRAP PILE offers many opportunities for savings.

Only 80 per cent of the metal going into your plant will come out as finished products—unless you've been able to defy the average. It means the other 20 per cent is wasted.

But you can recoup. Three broad approaches are suggested:

1. Reduce the percentage of scrap from your products.
2. Cut the cost of in-plant handling of your scrap.
3. Upgrade the quality of scrap generated in your plant.

Improvement of scrap quality is getting increasing attention. For instance, the Institute of Scrap Iron & Steel Inc. and the American Iron & Steel Institute are cosponsoring a research program at Battelle Memorial Institute, Columbus, Ohio. Its aim: A method of controlling scrap quality.

Battelle is seeking to: 1. Purge tramp metals that lower the quality of steel made from scrap. 2. Find a reliable way of determining the content of scrap bundles.

Alert companies are also doing a lot to improve their scrap quality via do-it-yourself programs. Here are 12 helpful tips you can put into practice:

## 1. Keep Scrap Segregated

Good scrap, properly segregated at your plant and kept free from extraneous materials, will bring you more money than if it's mixed. Reason: It's worth more to the mills and to the dealers who buy it from you.

Segregation at metalworking plants has increased in importance with the growing use of alloy steels. Now there's more chance of alloy steel scrap getting mixed into carbon steel scrap, or even nonferrous. Unsegregated alloys appear in remelted metal as contaminants, so steel mills shy away from scrap of mixed or unknown lineage. At best, the price of a mixed lot of scrap is fixed by the lowest grade material in it.

The place to segregate scrap is at the point of generation. (It's more economical to keep scrap grades separate than to unscramble mixed lots.) The way: Keep each kind separate from its origin and as long as it's in your possession. How simple or elaborate the equipment you'll use depends on the kind and quantity of scrap you generate. Equipment may range from a tote box positioned so that it is automatically loaded at the point of generation to an elaborate conveyor system that carries scrap from the point of generation to a railroad car.

Marking systems are a help. They may be color markings, code markings, or the name of material on tote boxes, bins, and other scrap containers.

Make sure the in-plant collector of scrap knows what material is coming off each machine. A material identification card issued to the machine operator will help the scrap collector know what is being worked.

**Scrap improvement is the big aim of veteran scrapman, Robert H. Clymer, who recently organized a ferrous scrap consulting firm, Clymer Associates Inc., Reading, Pa.**

**"The way I see it, scrap improvement is a three-pronged job: A job for the steel mills. A job for the scrap dealers. A job for the plants that generate scrap."**

Scrap is bought and sold by grade—and there are many. Know how your scrap will fit into the grades and segregate accordingly. Advice from your scrap dealer can be helpful. Ask him for a Scrap Institute Yearbook (published by the Institute of Scrap Iron & Steel Inc.). It contains grade specifications and other information on scrap and its use.

### 2. Minimize Your Scrap Output

You can do it two ways: 1. Redesign your product to eliminate as much scrap as possible. 2. Buy metals that are the nearest in shape, form, and size to your end product.

### 3. Re-use Scrap

After you have taken steps to minimize your scrap output, see if some of the leftovers can be used as raw material for smaller parts. As scrap, such waste may be worth $40 a ton; as raw material for parts, it may be worth $150 a ton.

### 4. Sell Scrap as Salvage

If scrap is good enough for a production operation but doesn't fit into your needs, check your scrap dealer. He may have a "Usable Department" which sells salvageable material. It will bring you more money than scrap.

### 5. Ask Your Scrap Dealer for Engineering Appraisal, Advice

Many experienced scrap dealers will help you with your segregation and handling problems. An increasing number of dealers are providing metalworking plants with special equipment such as engineered containers.

### 6. Put a Person of Executive Caliber in Charge of Scrap

Make him responsible for the greatest possible net return.

Is this a function of the sales, or purchasing department?

If a company does not have a salvage division or department, the assignment generally goes to the purchasing agent because of his knowledge of materials and market sources. The PA is in a position to check scrap disposal against raw material requirements, and he knows what the material is.

The case for the purchasing agent is upheld by Henry Van Noy, director of administration, Tasker Instruments Corp., Hollywood, Calif.:

"Assignment for disposal of materials no longer needed by a company falls to the purchasing department rather than the sales department. One reason for this is that sales is traditionally dedicated to the merchandising of the completed company product. In all likelihood, a sales staff will have little interest in or knowledge of the assorted business channels for disposal of other materials.

"The final stage in the procurement cycle is the disposal of material established as surplus to the

"Improvement starts with the recognition that scrap is a valuable byproduct. Only then can you consider such steps as segregation and preparation in their proper perspective."

"And another thing: Each industrial plant that makes a lot of scrap should have a man of executive caliber in charge of scrap. He will more than pay his way."

requirements of production.

## What Is Scrap Worth?

This is how Marquardt Corp., Van Nuys, Calif., figures it:

- **Mixed aluminum scrap is worth less than three-fourths of that separated and placed in marked containers.**
- **If steel scrap is mixed with aluminum scrap, the value of the aluminum scrap drops 60 per cent.**
- **Mixed stainless steel is worth about 80 per cent less than if it is separated and placed in marked containers.**
- **Re-usable aluminum (in small squares or rectangular sheets) is worth twice as much as clean segregated scrap.**
- **Re-usable stainless steel is worth four times as much as plain segregated scrap.**
- **Mixing aluminum and magnesium turnings and borings places both metals in a worthless category.**

"By contrast with the sales function, the purchasing department has some knowledge of the business channels for returning the material to productive use because it acted to obtain the materials originally."

He adds: "In the early stages of a company's evolution, the scrap program can be handled as a part-time assignment of the purchasing agent, but as the company grows, the need for a full-time property disposal administrator arises, and his timely appointment is a mark of alert management."

### 7. Develop a Rulebook

Some companies find it helpful to spell out the rules of scrap control in a manual. Example: Marquardt Corp. (formerly Marquardt Aircraft Co.), Van Nuys, Calif.

### 8. Ask for Bids on Your Scrap

It is in the scrap generator's interest to ask for bids, unless his outturn is exceptionally small. Make sure you give all prospective bidders the same information about the material and the service you seek.

The company that generates little scrap will probably find it satisfactory to hold the material and wait for favorable price changes, or have a contractual arrangement with a local dealer to take the scrap regularly.

### 9. Watch Your Weights

Sell only on certified truck or rail weights—not on a lot basis, using estimated weights. If you don't have weighing facilities, have your scrap weighed at public scales. Scrap dealers recommend, and often insist, upon their use when a plant does not have its own scales. Scrap dealers often are certified public weighers to protect themselves and the accounts they service.

Be careful and honest in loading scrap. If you load into a railroad car, see that it is clean and that no extraneous material gets into it. Otherwise, you may face a claim. An example: A heavy fall of wet snow into a car before it is loaded and weighed can give an inflated weight. The snow may melt by the time it is checked at the car's destination.

### 10. Consider Installation of Scrap Handling Equipment

What kind and how much?

The answers depend on the kind and amount of scrap your plant generates. Before taking any action, make a thorough analysis of what will be profitable to you. The costs of equipment must be measured against the return.

Generally two facets should be examined: Handling and processing.

Every plant that generates scrap has to handle it, if only to get it out of the way. But it doesn't have to process it, unless it chooses to do so.

The less scrap is handled, the more the net return.

If conveyors and similar equipment will reduce handling in your plant, consider them. Simple systems deliver scrap to central collection points where it is picked up and hauled away. More complex systems take it directly to storage bins, or to gondola cars, or to trucks. Selection of a disposal system depends on the amount and type of scrap to be handled and transportation facilities.

Don't try to do more scrap processing than you can economically justify. Only larger factories generate a sufficient quantity to make operation of a baling press or shear pay off. While a greater gross price is received for prepared scrap, additional costs (men and equipment, storage facilities, handling, tied up capital, market risks) and other problems must be fully considered.

It is probably better to let the scrap dealer do the processing, for generally, he can do it at lower cost.

### 11. Check Scrap as Inventory

It has value, and it should be properly accounted for.

### 12. Use In-plant Promotion Programs

Posters, bulletin boards, slogans, and meetings with plant personnel will help to minimize unnecessary scrap generation and maximize its value once it is generated.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* Steel, *Penton Bldg., Cleveland 13, Ohio.*

## The hard-boiled coating that couldn't be cracked

". . . boiled in water for one year without film failure or softening", excerpt from Glidden lab report on a special new coating system.

Tortures such as this are common in the Glidden laboratories where maintenance coatings are tested and proven. With good reason, too, because these coatings must stake their reputations on high performance standards.

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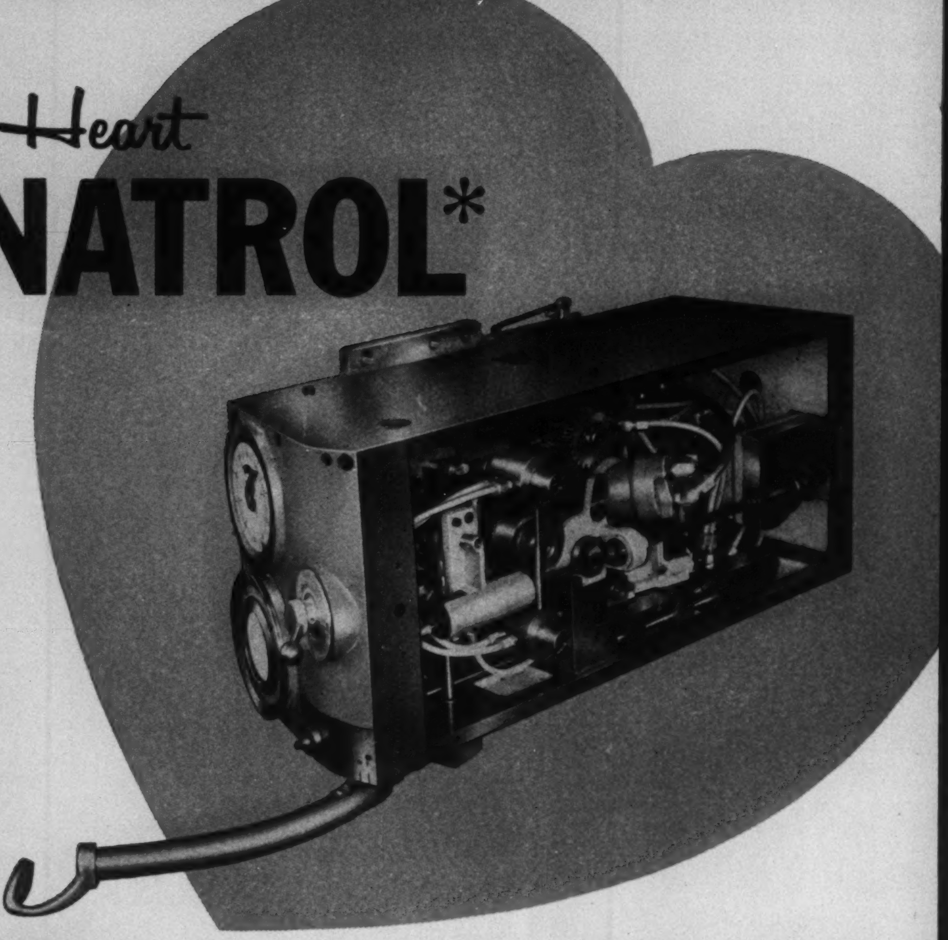
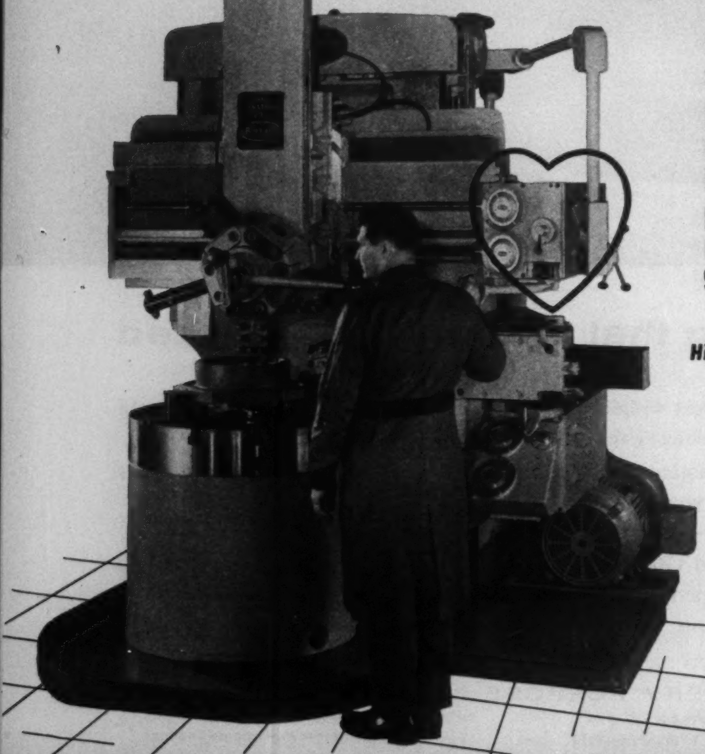
Write for your free copy of booklet containing complete information on all Glidden Protective Maintenance Coatings.

# This is the Heart of DYNATROL*

By means
of a single
lever or
from a simple
remote control
all head motions,
traverse and
feed engagement
are accomplished
through this
revolutionary new
feed works.





Dynatrol* provides infinitely variable feed rates throughout the full range and variable traverse rates from zero to nine feet per minute. Feed rates may be advanced or retarded while the machine is cutting to obtain maximum tool performance and productivity. Ten sizes from 26″ to 144″ table diameter. Send to The Bullard Company, Bridgeport 9, Conn. for complete catalog.

***High Spot Features of the Dynatrol *V.T.L. include:***

***VERSATILITY***

Available equipment includes: Bullard variable speed drive for infinitely variable table speeds throughout the full range with no loss of usable horsepower. Fully automatic operation by Bullard Man-Au-Trol or point-to-point or continuous path numerical control systems.

Unique Size-Au-Trol* for accurate positioning of all heads. Contouring attachments: Hydraulic, electronic or electro-hydraulic. Four of five-sided power-indexing turret heads. Thread cutting, drum scoring and angle turning attachment. Power-operated chucks.

***COMPACTNESS***

The new Bullard Dynatrol V.T.L. is compact in design, rigid in construction, lower in height, reduced in floor area.

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Automatic lubrication throughout . . . fewer parts . . . fewer adjustments . . . easily accessible.

*Trade Mark

**"YOU CAN'T BEAT A BULLARD"**

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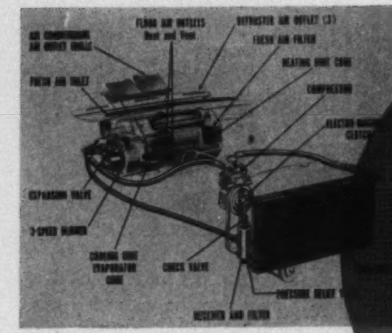
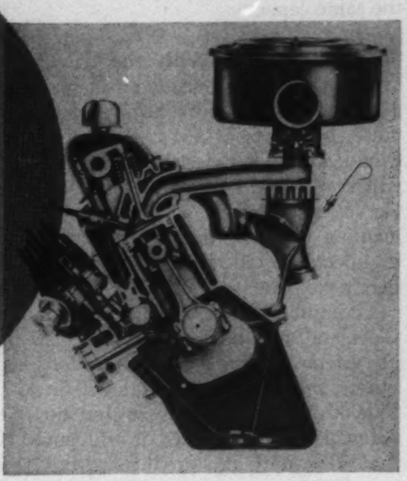
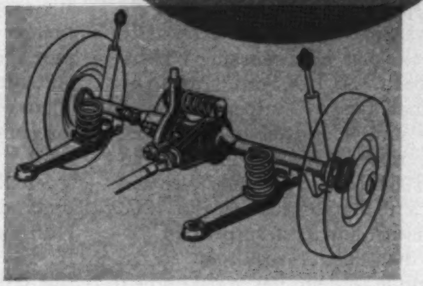


ACCESSORIES

## DESIGN TRENDS



ENGINE



SUSPENSION

# Detroit Prepares for More Breakthroughs

ALUMINUM ENGINES will create a greater need for simplified manufacturing techniques to make pistons and heads.

Higher compression ratios will require more fuel additives.

Brake programs have been slowed because compact cars are lighter and present systems will work satisfactorily.

Suspension systems still are undergoing changes, although nothing spectacular is expected in 1961.

• **Engine Talk** — It's pretty obvious to Detroit's designers that aluminum heads must be used with aluminum blocks. Present casting methods may be supplanted in time by extruded heads. One firm already is working on an extruded head design that reportedly is being tested on the Volkswagen. Chevrolet's Corvair also may go to extruded heads. Corvair now uses one head for each bank of three cylinders. In the extruded approach, a separate head would be used for each cylinder. In theory, heat differentiation would be reduced and manufacturing costs cut. It looks like extruded heads first must be tried on horizontally opposed engines.

Pistons probably will be extruded too, but not for several years. Higher compression ratios are expected by the mid-1960s and then cast aluminum pistons won't be adequate. Right now, extruded pistons are too expensive, but the industry thinks volume production can bring down costs. All of the auto companies have them on test. Ford also is testing molybdenum coated piston skirts and rings for possible use with high silicon aluminum liners in cylinder bores. They could appear in late 1961. When higher compression ratios appear, fuelmakers will have to add phosphorus to control cylinder deposits and rumble, say industry engineers.

More information on the Scotch yoke engines that Ford now has in advanced research indicates they're being strongly considered for possible production by 1964. That type of engine design was tried years ago but manufacturing techniques and materials couldn't provide satisfactory performance. Now Ford believes the Scotch yoke approach can be made to work using modern diecasting and permanent molding methods. In this design, each cylinder contains two opposed pistons yoked together to the crankshaft. Ford's smallest job is a four cylinder model with a 4.18 in. bore and a 1.93 in. stroke. Informants say the compression ratio is 9:1. A larger, eight cylinder version has a 5.5 in. bore and 2.2 in. stroke with an 11:1 compression ratio. The engines will be cast in aluminum with cast iron liners. They contain fewer parts than conventional aluminum engine

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designs and may weigh 50 lb less than aluminum powerplants with the same capacity.

- **Fuel Injection**—With the drive for economy, fuel injection still has a place, but manufacturing costs must be lower. GM's Rochester Products Div. is redesigning its unit which will again be offered on 1961 Corvettes. Corvair also is experimenting with it, but it's doubtful if injectors will make the grade here next year.

Thompson Ramo Wooldridge Inc., Cleveland, also has been revising its FI systems. It has a timed injection system that will cost about $50 in 150,000 volume levels. So far no automaker has indicated it will put the TRW unit into production, but several firms are testing it. The feeling around Detroit seems to be that fuel injection will be ready for a rerun in another two or three years.

- **Brakes Hold** — Cost still is the kicker that's keeping disc and liquid cooled brake designs from moving into production. With the lighter compacts, conventional shoe and drum brakes seem to be satisfactory. They'll work well enough on larger cars too as long as weight and horsepower aren't increased.

Chrysler Corp. is working on a power brake system that uses air pressure instead of a vacuum. It probably won't be ready for several years. Auto Specialties Mfg. Co., St. Joseph, Mich., has developed an oil cooled, disc brake retarder for trucks to replace drive line retarders. It has a sintered metallic lining and is oil cooled. One truck builder reportedly is considering it for heavy duty truck units.

With brakes remaining virtually unchanged, automakers have little reason to use smaller wheels. A 13 in. wheel seems to be it for the compact cars. Some 12 in. wheels have been tried, but haven't panned out for the cars nearing production. More aluminum wheel hub and drum assemblies will appear on larger cars. Buick has been using them on front wheels. They're optional on Pontiacs. Chrysler's Imperial supposedly will have them for 1961. Under test is an airless tire filled with polyurethane. Dayton Rubber Co. is doing the work, but says heat still is a problem to be overcome.

- **Suspension**—Rumors that Chevrolet will switch to torsion bars on its larger cars seem unfounded. Torsion springs are working well in the lighter Chevrolet trucks which may be how the rumor got started. Chevy has managed to cut manufacturing costs of its coil springs because it has eliminated centerless grinding of the wire used for the coils. It's using conventional mill drawn wire, say STEEL's sources. Oldsmobile reportedly plans to switch to coil springs in the rear of its 1961 cars. Pontiac and Cadillac may use variable rate coil springs on their 1961 models.

Suspension engineers feel that air-oil systems will be used eventually. Chrysler has been working on that approach. So has Ford. Apparently, that type of suspension won't come until a central power system is developed. It's not expected before 1964. Meanwhile, Chrysler may switch to flat torsion bars in 1962.

Another low cost suspension system that doesn't require a central hydraulic system has appeared among European carbuilders. Renault is supposed to have released it for production use. It's a hydropneumatic layout with four shock absorber struts and four lengths of steel tubing that perform some of the functions of a torsion bar. It also uses ride and leveling devices filled with nitrogen. Demonstrated in Detroit, the system is being considered for test by one U. S. firm. Considerable development is needed before it can be released for production.

### U. S. Auto Output

**Passenger Only**

| | 1960 | 1959 |
|---|---|---|
| January | 688,731 | 545,757 |
| February | ...... | 478,484 |
| March | ...... | 576,085 |
| April | ...... | 578,825 |
| May | ...... | 546,817 |
| June | ...... | 557,994 |
| July | ...... | 555,418 |
| August | ...... | 239,152 |
| September | ...... | 258,157 |
| October | ...... | 507,530 |
| November | ...... | 254,527 |
| December | ...... | 494,931 |
| Total | ...... | 5,593,677 |

| Week Ended | 1960 | 1959 |
|---|---|---|
| Jan. 9 | 163,249 | 133,362 |
| Jan. 16 | 173,713 | 135,953 |
| Jan. 23 | 175,060 | 126,843 |
| Jan. 30 | 173,231 | 119,678 |
| Feb. 6 | 165,367† | 114,282 |
| Feb. 13 | 160,000* | 115,491 |

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

- **Accessories** — Chrysler reportedly will release its alternator for all 1961 models. Production costs have been high on the hand wound stator components, but it's understood that this will be solved in time for next year's production runs. Other automakers aren't yet ready to ditch direct current generators. GM's Delco Products Div., Dayton, Ohio, has been developing several alternators. It's supposed to have one ready for limited use in GM's 1962 compact cars. Ford apparently will schedule an alternator for 1962 Lincolns. That company still is working on an aluminum battery strap, should have it on some of the '61 models.

Simplified heater-air conditioner units are under development. GM's Harrison Radiator Div., Lockport, N. Y., is working on a single control system. One knob or lever will set temperature and also operate heater and cooler. It's doubtful if it will be ready for 1961. Corvair is expected to have a car cooler available next year, although engineers claim they are having a problem finding a place to hang it on the car. Because of Corvair's air cooled engine, the conditioner reportedly will utilize some unique cooling methods.

Transistorized radios still will be limited to luxury cars. The compact portable radios introduced by GM will not be picked up by the rest of the industry because costs are too high and manufacturing volume too low. Motordom will be watching a hang-on FM receiver that can be attached to the dashboard. It's being developed by a Chicago manufacturer and will be priced around $125. If it's successful, Detroit may seek a licensing arrangement or develop a similar unit of its own.

Cadillac is the division that's supposed to adopt hydraulic windshield wipers next year. Other manufacturers are sticking with electric wipers, although these are optional for Ford and Rambler. The hydraulic wiper has been developed by Trico Products Co., Buffalo. It will be operated by the power steering pump.

William Krause, left, and John Rasp of Westinghouse's Beaver plant inspect laminations delivered by "Flying Press" stacking chute.

# Westinghouse blanks silicon laminations at 450 strokes/minute on Wean "gearless" press

The production of "E" and "I" laminations demands equipment with both speed and precision. At the Westinghouse Standard Control Division plant in Beaver, Pa., millions of these stampings are required each month for five models of line starters—yet each must meet final tolerances of .0003".

Westinghouse is getting both high production and tight quality control with its specially designed, coil-fed Wean "Flying Press." This exciting new press design is truly "gearless," the three cranks being synchronized with an "A" frame. The unique die motion of the "Flying Press" permits operation at up to 450 strokes/minute, or 1800 inches/minute strip feed—fully twice the speed attainable with other presses in this service. Other advantages of the Wean "Flying Press" over conventional presses are 40% longer die life, open design that permits fast, easy die changes, safety devices to prevent die damage, and automated handling of the finished pieces.

For a more detailed description of this pace-setting press application, write to Wean for an illustrated article. The new "gearless Flying Press" is typical of the advanced equipment which has earned Wean its leadership in the field of coil processing. Your experienced Wean sales engineer will be glad to tell you how this concept can help *you* cut production costs.

WEAN EQUIPMENT CORPORATION
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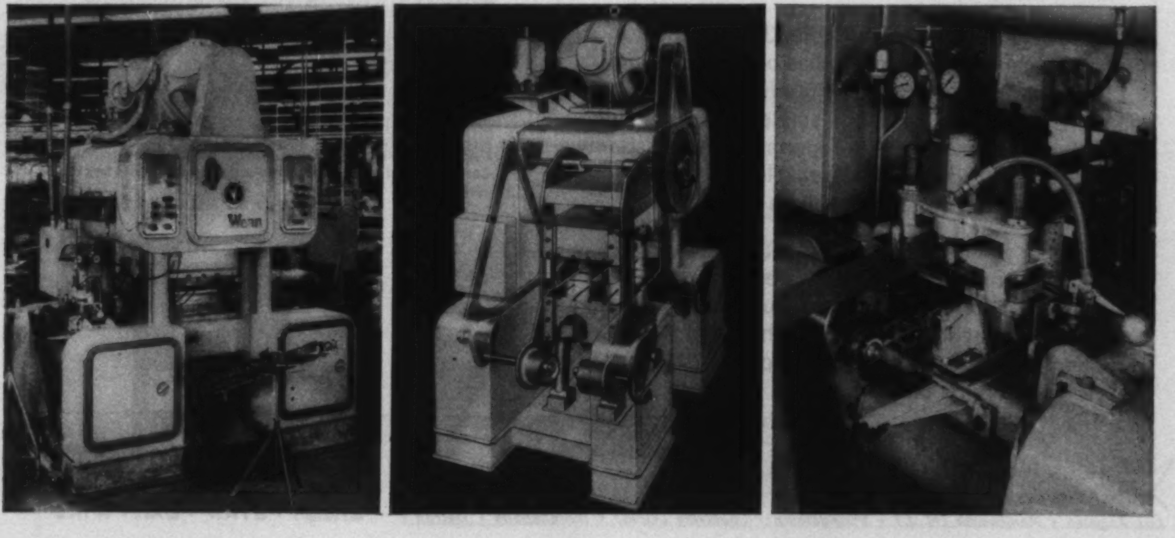
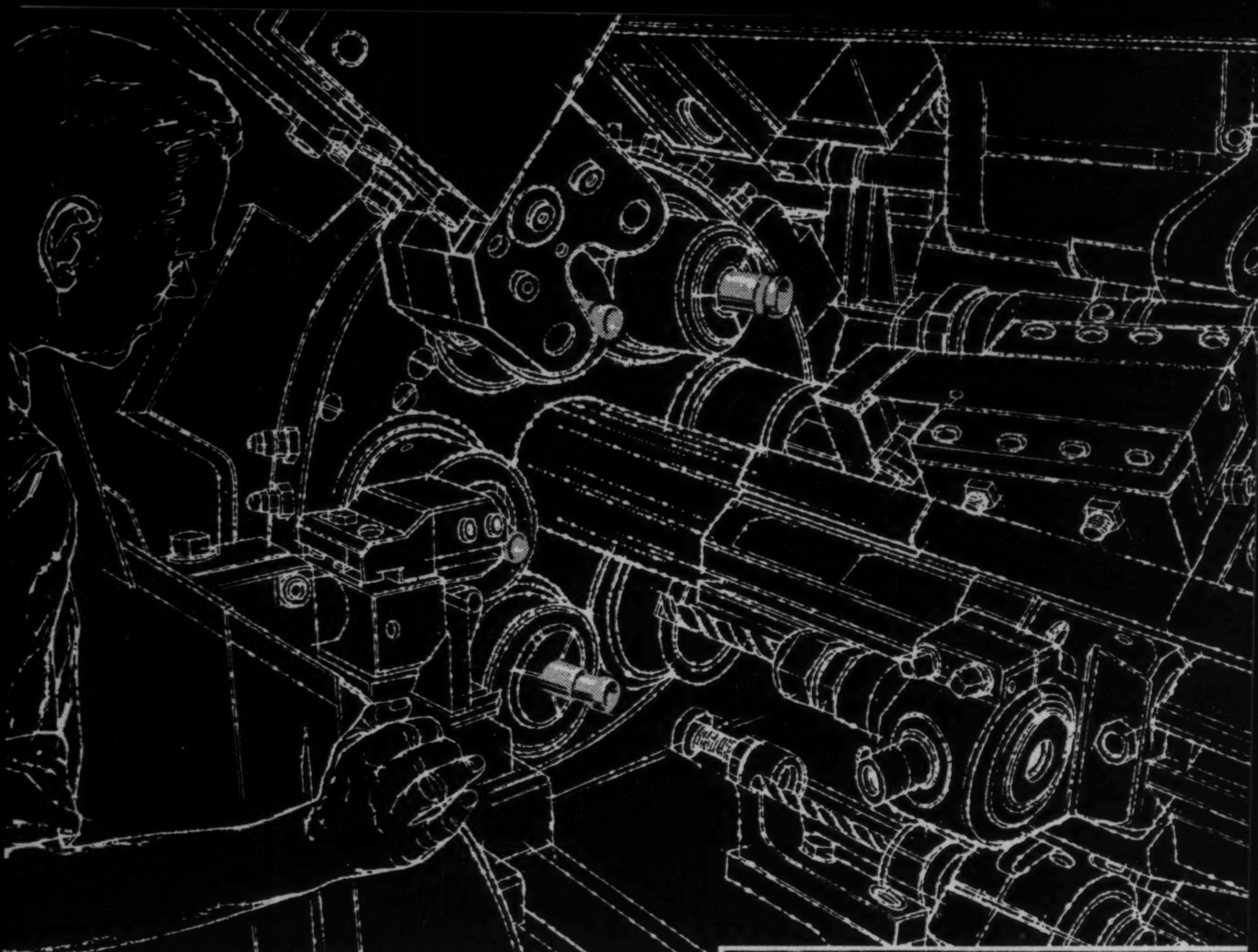
**WEAN**

**Left to right:** open design speeds die changes in "Flying Press"; cutaway shows how press cranks are tied together and the relative die motions; pad feed accurately indexes strip.





Careful attention to every production detail is the key to J&L quality.

# The Ultimate Test

The ultimate test of quality in stainless steel bars takes place in screw machine production, where every bar is literally cut to pieces.

The Perry-Fay Company, Elyria, Ohio, a leader in screw machine production, has been subjecting J&L bars to this demanding production-line test for more than a year, **without a single failure, without a single reject.** Perry-Fay reports: "We consistently get superior surface finish, closer tolerances, fully formed rolled threads with J&L stainless bars."

Whether you need stainless steel bar stock for high-speed, high-production operations, or a single bar for extraordinary requirements, turn to J&L. J&L leads the industry in melt shop standards for stainless steel, the point where quality starts—and new production profits begin.

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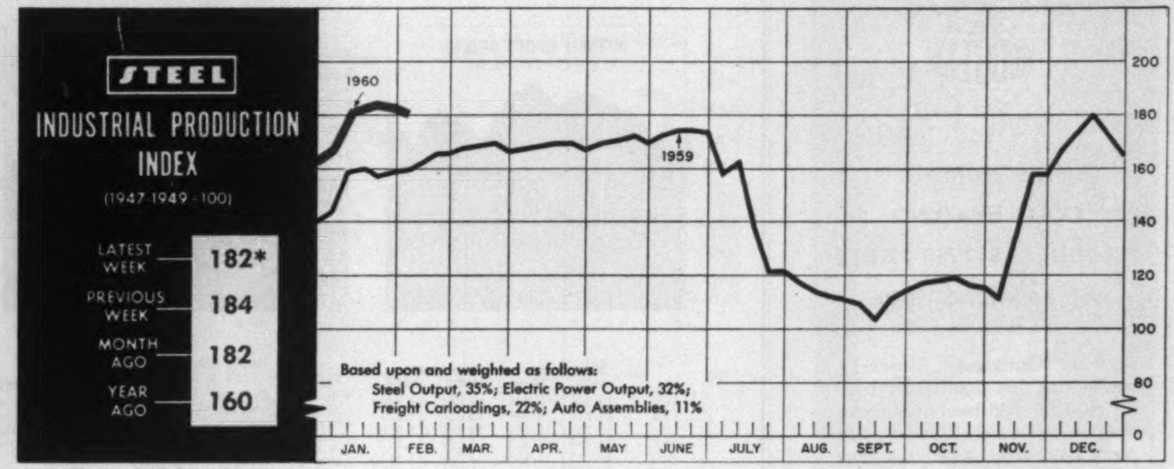

*Week ended Feb. 6.

# Lack of Urgency Alters Forecasts

EARLY PREDICTIONS of the 1960 economic level are coming in for a close second look. In many cases, business analysts are downgrading their estimates; in others, they see a leveling out of the peaks and valleys and the spreading of prosperity over a longer period.

One thing stands out: There is a lack of urgency in today's business picture but little, if any, pessimism.

● **Less Bounce** — While there are many factors contributing to that feeling, three in particular account for the retreat from the overoptimism which followed the steel strike settlement. 1. The demand for steel is not as heavy as anticipated. 2. Auto demand is not responding as fast as most producers had hoped after full-scale production got underway. 3. Interest rates, which only a month ago seemed on the verge of another upward flight, have remained fairly stable.

● **Case for Steel**—Part of the miscalculation stems from the lack of any really good measurement of steel inventories. Some observers feel that stocks were higher prior to the strike than anybody dared to estimate. Also, inventories were not as low at the end of the strike as was commonly believed, except in certain well-publicized cases such as the auto industry. So while demand for steel is still good, there is no feverish rush for inventory building.

In addition, there is a growing feeling that consumers are not going to overbuild steel stocks. With no threat of a strike for another two years or so, users may let the steel companies carry their stocks for them.

Finally, most observers expected a headlong rush to build stocks following the steel settlement out of fear of rising prices. The rush did not materialize, bearing out the rule of thumb that price hedging is attractive: 1. When it can be done in a relatively short period prior to the anticipated boost. 2. When

## BAROMETERS OF BUSINESS

| | LATEST PERIOD* | PRIOR WEEK | YEAR AGO |
|---|---|---|---|
| **INDUSTRY** | | | |
| Steel Ingot Production (1000 net tons)[2] | 2,693[1] | 2,683 | 2,371 |
| Electric Power Distributed (million kw-hr) | 14,350[1] | 14,313 | 13,292 |
| Bituminous Coal Output (1000 tons) | 8,870[1] | 8,650 | 8,585 |
| Crude Oil Production (daily avg—1000 bbl) | 7,150[1] | 7,136 | 7,213 |
| Construction Volume (*ENR*—millions) | $377.4 | $372.9 | $284.2 |
| Auto, Truck Output, U. S., Canada (*Ward's*) | 202,701[1] | 216,185 | 148,328 |
| **TRADE** | | | |
| Freight Carloadings (1000 Cars) | 595[1] | 602 | 565 |
| Intercity Truck Tonnage (changes from year ago) | +4.8% | +6.9% | ...% |
| Business Failures (Dun & Bradstreet) | 281 | 302 | 322 |
| Currency in Circulation (millions)[3] | $31,566 | $31,650 | $31,121 |
| Dept. Store Sales (changes from year ago)[3] | +6% | +8% | +8% |
| **FINANCE** | | | |
| Bank Clearings (Dun & Bradstreet, millions) | $26,670 | $25,820 | $25,024 |
| Federal Gross Debt (billions) | $291.1 | $291.7 | $285.8 |
| Bond Volume, NYSE (millions) | $29.2 | $28.5 | $31.7 |
| Stocks Sales, NYSE (thousands of shares) | 14,075 | 14,005 | 16,141 |
| Loans and Investments (billions)[4] | $102.3 | $102 8 | $102.9 |
| U. S. Govt. Obligations Held (billions)[4] | $26.7 | $26.9 | $34.7 |
| **PRICES** | | | |
| STEEL's Finished Steel Price Index[5] | 247.82 | 247.82 | 247.82 |
| STEEL's Nonferrous Metal Price Index[6] | 234.3 | 234.0 | 218.8 |
| All Commodities[7] | 119.2 | 119.5 | 119.3 |
| Commodities Other than Farm & Foods[7] | 128.5 | 128.6 | 127.5 |

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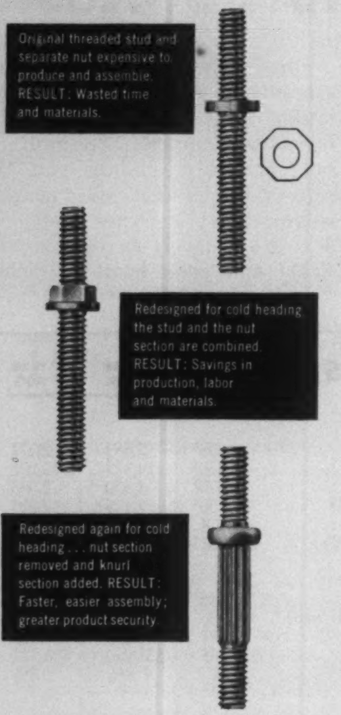
*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1960, 2,849,306; 1959, 2,831,846. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

IT PAYS TO HAVE GOOD CONNECTIONS
HUBBELL

HOW HUBBELL
COLD HEADING
PRODUCES BETTER PARTS
AT FASTER SPEEDS

Optimum results aren't necessarily reached the first time a part is redesigned for cold heading. Careful re-examination by Hubbell engineers may suggest a new and more efficient redesign which will make a part even more economical. As in this Hubbell case history, design evolution produced a better end product with substantial savings in assembly costs.



Original threaded stud and separate nut expensive to produce and assemble. RESULT: Wasted time and materials.

Redesigned for cold heading the stud and the nut section are combined. RESULT: Savings in production, labor and materials.

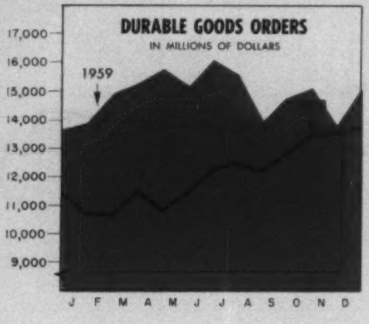
Redesigned again for cold heading . . . nut section removed and knurl section added. RESULT: Faster, easier assembly; greater product security.

*Hubbell Cold Heading may provide equally dramatic results for you.* Whether it is presently cold headed or not, send blueprint of part or sample for analysis and estimate.

**See the Hubbell Fastener Catalog in Sweet's Product Design File 7/Hu**

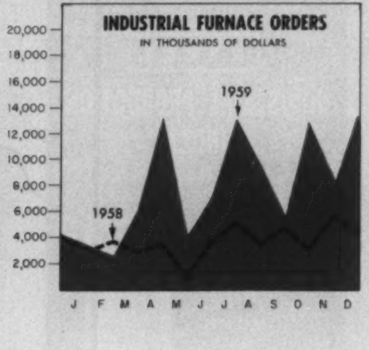
**HARVEY HUBBELL,**
**INCORPORATED**
**Machine Screw Department**
**Bridgeport 2, Connecticut**

## THE BUSINESS TREND



|  | New Orders* 1959 | New Orders* 1958 | Sales* 1959 | Sales* 1958 |
|---|---|---|---|---|
| Jan. .. | 13,900 | 10,704 | 13,541 | 12,646 |
| Feb. .. | 14,918 | 10,688 | 13,870 | 12,038 |
| Mar. .. | 15,323 | 11,488 | 14,400 | 11,670 |
| Apr. .. | 15,796 | 10,833 | 15,166 | 11,532 |
| May .. | 15,241 | 11,423 | 15,515 | 11,643 |
| June .. | 16,133 | 12,245 | 15,771 | 12,086 |
| July .. | 15,493 | 12,512 | 15,384 | 12,256 |
| Aug. .. | 13,974 | 12,177 | 14,008 | 12,385 |
| Sept. . | 14,747 | 12,859 | 14,113 | 12,723 |
| Oct. .. | 15,099 | 13,530 | 14,047 | 12,943 |
| Nov. .. | 13,721 | 13,574 | 13,479 | 13,295 |
| Dec. .. | 14,886† | 13,673 | 14,992† | 13,613 |

*Seasonally adjusted. †Preliminary.
U. S. Office of Business Economics.
Charts copyright, 1960, STEEL.



|  | 1959 | 1958 | 1957 |
|---|---|---|---|
| Jan. ...... | 3,518 | 3,047 | 8,775 |
| Feb. ...... | 2,741 | 3,684 | 9,769 |
| Mar. ...... | 6,146 | 2,871 | 10,485 |
| Apr. ...... | 13,328 | 3,572 | 4,559 |
| May ...... | 4,174 | 954 | 5,389 |
| June ...... | 7,029 | 3,672 | 4,369 |
| July ...... | 13,141 | 5,169 | 4,332 |
| Aug. ...... | 9,738 | 3,533 | 3,924 |
| Sept. ...... | 5,560 | 4,846 | 7,463 |
| Oct. ...... | 12,967 | 3,105 | 3,674 |
| Nov. ...... | 8,442 | 5,597 | 2,832 |
| Dec. ...... | 13,437 | 3,518 | 3,992 |

Industrial Heating Equipment Assn. Inc.

the increase is large enough to outweigh the costs of carrying the extra load.

- **Output Leveling Off** — So steel output is softening well before most observers had expected. But it is so slight it is almost insignificant. The record weekly production (in the week ended Dec. 12, 1959) was 2,732,000 net tons. Last week (ended Feb. 14) output was scheduled for 2,693,000 tons, just 39,000 tons shy of the peak. That's equal to about 2 hours of production at the industry's record rate.

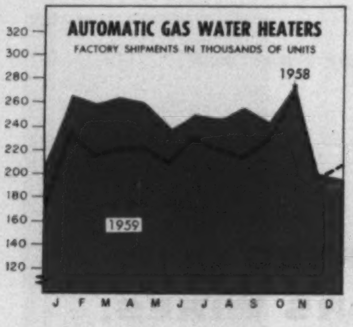
- **Case for Autos**—Few spokesmen within the auto industry will admit to anything but the brightest optimism. But the onlookers are chary about abnormally high production in the face of slower than expected sales.

Several factors have modified the normal sales-production relationship this year: 1. A larger number of models than ever before. 2. The need for increased dealers' stocks because of greater selectivity. 3. A steel strike which limited availability for nearly three months. 4. Compacts.

However, automakers are not oblivious to the hard facts of sales, and they have started to cut back. But the decline, as in steel, has been a matter of a few hours' production. Cars are still coming off the assembly lines in near record numbers. Until something more concrete than an "uneasy feeling" comes along, Detroiters are still counting on 7 million unit sales this year.

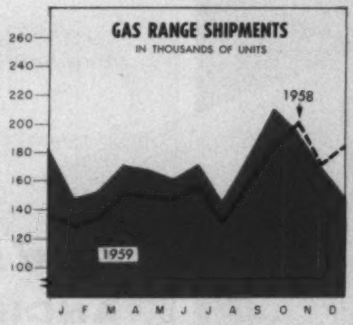
- **Case for Interest Rates**—The failure of the prime discount rate to climb another notch last month put a damper on some boom thinking. (Reasoning: Another increase would be a sure sign that the government still thinks the boom needs to be kept in line. No increase would mean the boom is contained or, perhaps, over.)

But with personal income climbing to an all-time peak and corporate earnings showing a healthy rise, the immediate demand for money has remained pretty well within the limits of supply. There is no guarantee that rates won't go up tomorrow, but few businessmen expect it to happen for a while. The stability of interest rates may well indicate a corresponding stability of business conditions at a high level without the excesses that have caused trouble in the past.



| | Shipments—Units<br>1959 | 1958 | 1957 |
|---|---|---|---|
| Jan. .. | 266,200 | 235,400 | 214,900 |
| Feb. .. | 259,700 | 216,300 | 208,200 |
| Mar. .. | 265,900 | 221,600 | 226,600 |
| Apr. .. | 261,300 | 221,900 | 238,200 |
| May .. | 239,300 | 210,000 | 233,400 |
| June .. | 250,000 | 231,000 | 211,700 |
| July .. | 245,100 | 221,400 | 192,500 |
| Aug. .. | 256,000 | 215,500 | 210,300 |
| Sept. .. | 243,800 | 230,000 | 215,500 |
| Oct. .. | 274,200 | 265,900 | 234,700 |
| Nov. .. | 200,300 | 197,100 | 173,500 |
| Dec. .. | 195,400* | 207,300 | 172,800 |
| Totals . | 2,957,200 | 2,673,400 | 2,532,300 |

*Preliminary.
Gas Appliance Mfrs. Assn.



| | Shipments—Units<br>1959 | 1958 | 1957 |
|---|---|---|---|
| Jan. ... | 148,800 | 128,200 | 149,600 |
| Feb. ... | 152,400 | 134,200 | 161,600 |
| Mar. ... | 171,500 | 149,300 | 179,400 |
| Apr. ... | 166,900 | 148,200 | 168,800 |
| May ... | 161,300 | 147,200 | 156,200 |
| June ... | 171,900 | 155,900 | 155,300 |
| July ... | 145,500 | 129,100 | 137,400 |
| Aug. ... | 177,200 | 157,700 | 182,600 |
| Sept. ... | 210,300 | 182,300 | 192,100 |
| Oct. ... | 194,500 | 212,200 | 195,500 |
| Nov. ... | 168,600 | 171,200 | 154,300 |
| Dec. ... | 148,000 | 181,000 | 135,800 |
| Totals. | 2,016,900 | 1,896,500 | 1,968,600 |

*Preliminary.
Gas Appliance Mfrs. Assn.

• **Adjusting the Outlook**—Because of the lack of urgency, many economists are cutting back on their forecasts. For instance, some who earlier predicted a 130 million ton steel year now lean toward 125 million. Or if they figured on a top annual rate of $520 billion for gross national product in the fourth quarter, they are talking in the neighborhood of $515 billion.

But they aren't pessimistic. They reason that a year lacking in boom peaks could minimize a downturn in 1961. (Most are still anticipating some kind of a cutback, probably starting in the first half of '61.) There is even the possibility of a slight downturn near the middle of this year, once inventory demand is fully satisfied. "It's possible we could come out of that near the end of the year and see a good 1961 ahead," comments one bank economist.

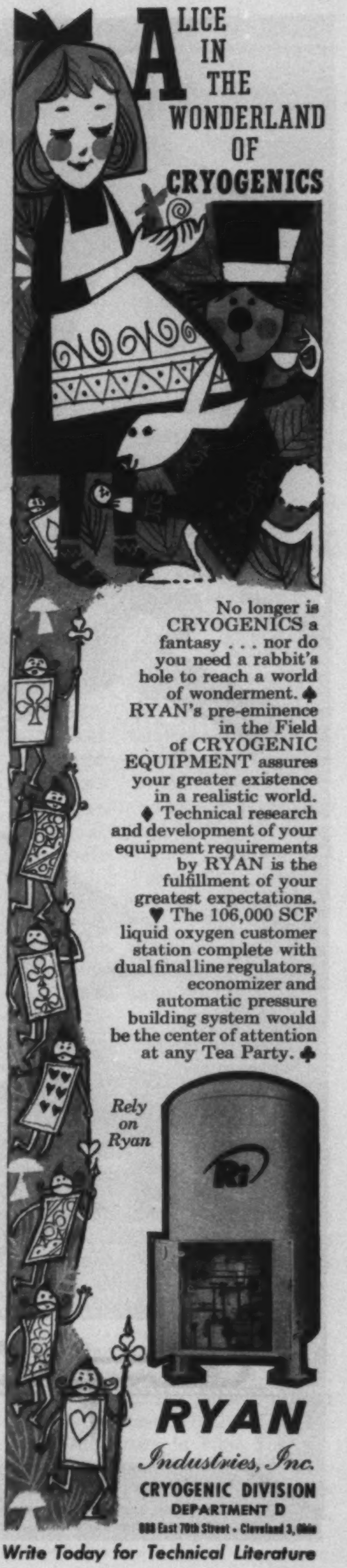
## Index 3 Points Below Peak

STEEL's industrial production index slipped for the second consecutive week during the period ended Feb. 6. At a preliminary 182 (1947-49 = 100), the trend line is 3 points beneath the all-time high. But the decline cannot be interpreted as a general trend at this time. In only one year since 1954 has the index failed to lose strength in either January or February. (The exception: 1955.)

All the components except electricity contributed to the drop. Cold weather and heavy demand in the major industrial districts account for the unusually high level of electricity generation. For the first six weeks of 1960, the weekly totals have topped the year-ago figures 5.6 to 9.7 per cent. Weekly output has been holding around the 14.3 billion kw-hr level. However, if the pattern of the last four years holds, the figure will slide off steadily for the next few weeks.

The cutbacks in both steel and auto production, while minor, have knocked about 2 points off the index. It is difficult to evaluate the automotive decline of 7864 units. A strike at Chevrolet accounted for almost 6800 of them. But the stoppage came amid rumors that several of the big producers were considering cutbacks to adjust production to sales.

Railroad freight carloadings are fluctuating around 600,000 cars a week and will probably hold there until the iron ore shipping season opens in the spring.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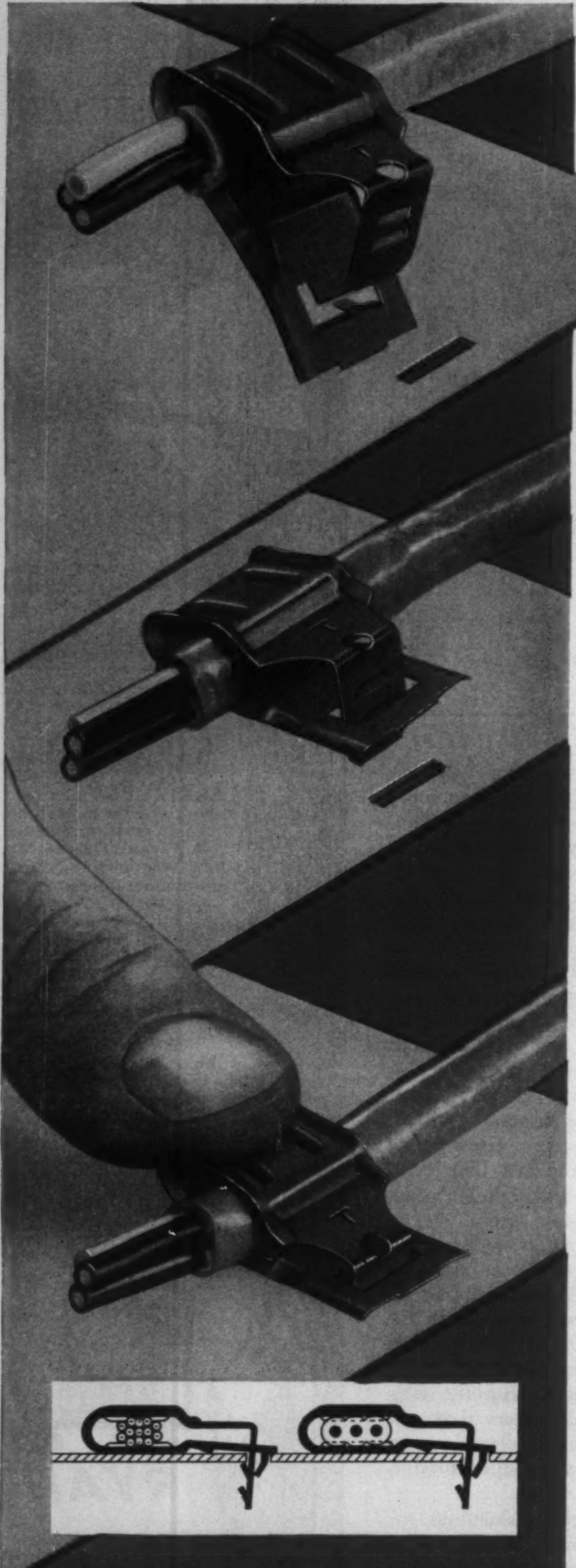

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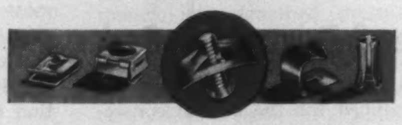

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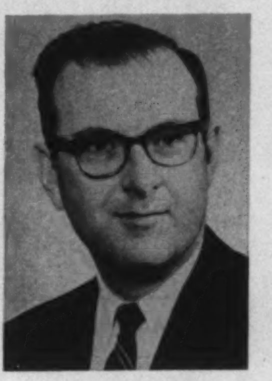
**WILLIAM J. BUECHLING**
*Aristoloy Steel gen. supt.*



**GEORGE F. CLIFFORD**
*Spinco Div. manager*

**A. WILLIAM FRASER**
*Worthington v. p.-sales*

**LAD J. BAYER**
*Warner & Swasey promotion*

**William J. Buechling**, assistant general superintendent, was made general superintendent, **Aristoloy Steel Div.**, Copperweld Steel Co., Warren, Ohio.

**George F. Clifford** was made manager, Spinco Div., **Beckman Instruments Inc.**, Palo Alto, Calif. He was acting manager of the division.

**George W. Mawhinney** was named director of purchasing for **Jessop Steel Co.**, Washington, Pa. He succeeds **C. A. Ewing**, retired. **Ross Herron** was made purchasing agent and **Earl P. Murphy Jr.** a buyer.

**Robert D. Tuttle** was made assistant to the sales vice president at **H. M. Harper Co.**, Morton Grove, Ill. He is replaced as marketing manager by **R. M. Hausheer.**

**Robert Brady** was named to the new post of manager-power tool sales, **Disston Div.**, H. K. Porter Company Inc., Philadelphia. He was district manager, New York and New England area, and is replaced by **Lester A. Spangenberg**, who also is over the district comprising Pennsylvania, New Jersey, Maryland, and Delaware. **C. Earl Weber**, former product manager of hardware, was named sales manager-hardware, and will supervise Mr. Brady in his new post.

**William C. French Jr.** was made sales manager-eastern area, **National Tube Div.**, U. S. Steel Corp. He succeeds **Louis W. Mason**, now general sales manager. Mr. French is in New York.

**A. William Fraser** was elected vice president and general sales manager, **Worthington Corp.**, Harrison, N. J. He was general marketing manager.

**Roll Forming Corp.**, Shelbyville, Ky., appointed **W. P. Williams Jr.** purchasing agent to replace the late **Ballard Morris.** He was chief purchasing agent for Kingham Trailer Corp.

**George E. Gunderson** was appointed vice president-production, **Brad Foote Gear Works Inc.**, Chicago, a new post. He was assistant production manager.

**Robert D. Clark** was named president, **Northern Malleable Iron Co.**, St. Paul, succeeding **George T. Boli**, now chairman. **Donald B. Fulton** was advanced from vice president-manufacturing to vice president and general manager.

**Dr. Harold T. Clark** was named to the new post of administrative director, Research & Development Dept., **Jones & Laughlin Steel Corp.**, Pittsburgh. He was director of research.

**D. W. Blend** was elected vice president-operations, **Calumet & Hecla Inc.**, Chicago. He was vice president of the company and general manager, Wolverine Tube Div.

**Clyde Skeen** joined **Temco Aircraft Corp.**, Dallas, as executive vice president and general manager. He was vice president for weapons system program management of Boeing Airplane Co.'s Aerospace Div.

**Lad J. Bayer** was made general manager, Control Instrument Div., **Warner & Swasey Co.**, Cleveland. He was chief industrial engineer. The division recently moved its manufacturing operation from New York to expanded facilities in Flushing, N. Y.

**J. Frank Oehlhoffen** and **Frank X. Bujold** were elected executive vice presidents of **Kaydon Engineering Corp.**, Muskegon, Mich. Mr. Oehlhoffen is in charge of product development; Mr. Bujold in charge of manufacturing, purchasing and engineering, and continues in charge of the Frauenthal Div.

**Donald D. Scarff** was made general manager of **General Electric Co.'s** Large Lamp Dept. in Cleveland. He succeeds **Herman L. Weiss**, recently made general manager, Lamp Div., Nela Park (Cleveland).

**James W. Hatch** was made general manager of the Downey, Calif., plant of **Ex-Cell-O Corp.**

**Lee P. Burgess** was named vice president, **Belcher Malleable Iron Co.**, Easton, Mass. He was sales manager, Wire Rope Corp. of America, and joined Belcher last July.

**N. L. Harms**, division vice president, **Symington Wayne Corp.**, Salisbury, Md., was named to head the newly formed Foreign Div. He has headquarters in New York.

**Albert N. Crawford** was made sales manager, Industrial Tank Div., **Cutler Metal Products Co.**, Cam-

**ROGER MARRIOTT** **HAROLD A. JOHNSON**

*Barnes Drill officers*

**R. E. FLETCHER** **JOHN A. KAYSER**

*Dana divisions-chief engineers*

den, N. J. He was manager of the Tank Div. of John Wood Co.

**Roger Marriott** was elected president and general manager of **Barnes Drill Co.**, Rockford, Ill. **Harold A. Johnson** was named executive vice president; **Charles Birks** secretary-treasurer. **A. M. Johnson**, former president, retired.

**George F. Topinka** was made chief engineer, Power Cylinder Div., **Hannifin Co.**, Des Plaines, Ill. He was administrative engineer in charge of new product design and development at Borg & Beck Div., Borg-Warner Corp.

**H. Myles Jacob** was elected president, **Inspiration Consolidated Copper Co.**, New York. **H. Carroll Weed** was elected vice president, continuing as general manager.

**James R. Pumphrey** was named product manager-stainless strip in the Sales Dept., Stainless & Strip Div., **Jones & Laughlin Steel Corp.** He is in the division's Youngstown offices. He was with Sharon Steel Corp.

**Frank K. Armour** was appointed chief engineer of **Interlake Iron Corp.**, Cleveland. He succeeds the late **Henry W. Campbell.**

**William F. Morrow**, general sales manager, **Pioneer Aluminum Inc.**, Los Angeles, was named vice president-sales.

**F. E. Plumley** was named director of purchasing; **J. J. Forst** metals specialist for **Olin Mathieson Chemical Corp.**, New York. Mr. Plumley continues to handle purchasing for the Winchester-Western Div. until a replacement is selected.

**Wean Engineering Co. Inc.**, Warren, Ohio, elected **R. J. Wean Jr.** executive vice president; **H. W. Lyon** vice president-sales; **D. A. McArthur** vice president-engineering; **Miss H. A. Moran** vice president-assistant secretary. **G. M. Baughman** was made sales manager; **M. D. Baughman Jr.** chief engineer.

**R. J. WEAN JR.** **H. W. LYNN** **D. A. McARTHUR**

◆ *Wean engineering executive positions*

**Dana Corp.**, Toledo, Ohio, named **R. E. Fletcher** chief engineer, Mechanical Transmission Div., with assistant chief engineers **Louis Stuckey** (advanced engineering), and **Norman Revenaugh** (producduction engineering). **John A. Kayser** was named chief engineer, Universal Joint Div., with **James Lyons** assistant chief engineer.

**William Bournias** was named chief engineer, **Buhr Machine Tool Co.**, Ann Arbor, Mich. He was project engineer on special, multiple operation, machine tools.

**Jack F. Lewis**, vice president-manufacturing, **Hyster Co.**, was named managing director of Hyster Ltd. in Scotland.

**Edward F. McWhirter** was made sales manager, **Meier Brass & Aluminum Co.**, Detroit.

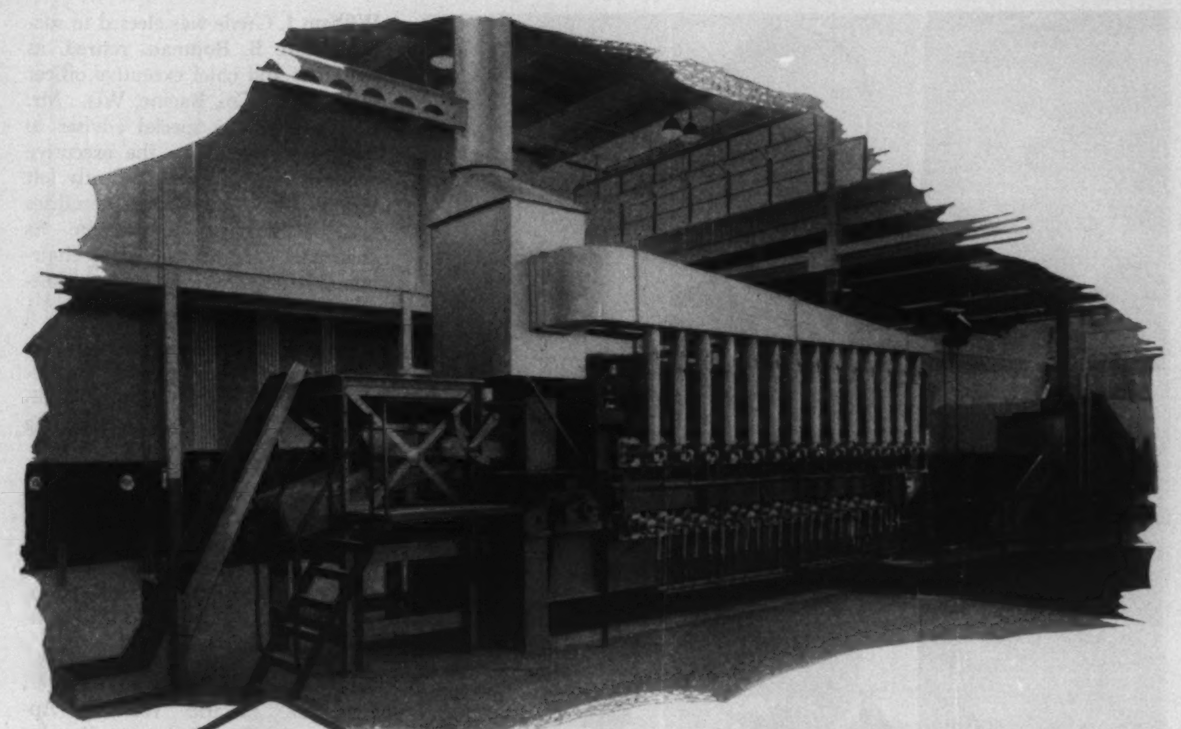
**Francis J. Murphy** was named vice president-general manager, **Yuba Erectors**, a division of Yuba Consolidated Industries. He is in Emeryville, Calif.

**Jay G. Jerry** was made supervisor of application engineering, **Armco Steel Corp.**, Middletown, Ohio.

**Earl J. Tessmer** was made assistant purchasing agent, **Young Radiator Co.**, Racine, Wis.

**Rockwell-Standard Corp.**, Coraopolis, Pa., named **M. B. Hammond** (vice president) a vice president-bumper group sales, a new post.

**John C. Williams Jr.** was elected vice president of **Weighing & Control Components Inc.**, Hatboro, Pa., a division of CompuDyne Corp. He



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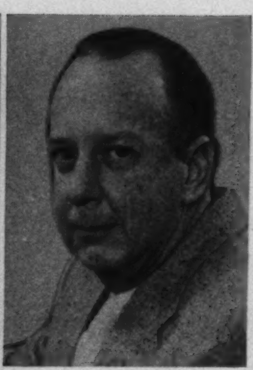
*Paslode v. p.*



W. P. ARMSTRONG
*Pacific Tube gen. sales mgr.*

D. L. BOHON
*DeVilbiss indus. sales mgr.*

ARTHUR W. THORNTON
*Lorain Wks. gen. supt.*

RUSSELL W. KENYON
*Kerns gen. sales mgr.*

was general manager and secretary.

**D. L. Bohon** was made manager of industrial sales for **DeVilbiss Co.,** Toledo, Ohio. He succeeds **E. F. Frey,** who continues to serve as sales liaison officer between industrial and jobber sales divisions, and assumes added duties of correlating sales on metal fabricator products manufactured by the Detroit subsidiary.

**Thomas Z. Hayward** was appointed senior vice president; **Weaver E. Falberg** vice president-sales, **Joseph T. Ryerson & Son Inc.,** Chicago. Mr. Falberg, former general sales manager, succeeds Mr. Hayward.

**REF Mfg. Corp.,** Mineola, N. Y., appointed **Harold Maron** as supervisor of sales, ground support equipment. He was manager of equipment sales for Greer Hydraulics Inc.

**L. L. Compiano** was appointed purchasing agent at **Pacific Coast Engineering Co.,** Alameda, Calif., succeding **M. H. LaRue,** retired.

**Arthur W. Thornton** was made general superintendent, Lorain, Ohio, Works, **National Tube Div.,** U. S. Steel Corp. He succeeds **Truman H. Kennedy,** appointed vice president-operations of the division.

**Russell W. Kenyon** was appointed general sales manager, **L. R. Kerns Co.,** Chicago. He was eastern regional manager.

**J. G. Hepler,** assistant director of purchases, National Tube Div., **U. S. Steel Corp.,** Pittsburgh, was named assistant to the vice president-purchases for the corporation. **J. D. Peters** and **S. T. Johnson** were made assistant purchasing directors. **Joseph F. Byrne,** former project purchasing agent in San Francisco for Columbia-Geneva Div., succeeds Mr. Hepler as assistant director of purchases. **R. D. Crowley,** former assistant director of purchases-Pittsburgh, was made director of purchases at Columbia-Geneva Steel. **C. H. Barringer,** assistant director of purchases-Pittsburgh, retired.

**William J. Grede** was elected to succeed **Marc B. Rojtman,** retired, as president and chief executive officer of **J. I. Case Co.,** Racine, Wis. Mr. Rojtman will be special adviser to the president and to the executive committee. Mr. Grede recently left the presidency of Grede Foundries Inc., Milwaukee, to become its chairman. He has served as chairman of the Case executive committee.

**Harry C. Lingle** was elected vice president-engineering and production, **Paslode Co.,** Chicago, a division of Signode Steel Strapping Co.

**W. P. Armstrong** was made general sales manager, **Pacific Tube Co.,** Los Angeles. **A. C. Geldner Jr.** was named manager-bar sales; **H. R. Shuptrine** assistant plant superintendent; **C. A. Taylor** office manager.

**D. W. Morgan** was made manager, Essington Electric Welding Apparatus Factory, Essington, Pa., for **Linde Co.,** a division of Union Carbide Corp. He was assistant manager, Tonawanda, N. Y., factory.

**William H. Swann** was made plant manager, Montana Ferroalloys Inc., Woodstock, Tenn., subsidiary of **Chromium Mining & Smelting Corp.,** Chicago. He succeeds **Gordon Hastings,** now with the parent company.

**W. G. Schmidt** was appointed sales manager of **Osco Steel Co.,** Cleveland.

**A. B. Walker** was made assistant director-research and development, **Research-Cottrell Inc.,** Bound Brook, N. J. He succeeds **Dr. H. J. White** who accepted an appointment at Portland, Oreg., State College.

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## OBITUARIES . . .

**Alfred W. Mellowes,** 80, president, **Charter Wire Co. Inc.,** Milwaukee, died Jan. 3.

**J. D. Ramsay,** former president, **North American Refractories Co.,** Cleveland, died Jan. 31.

**Harry C. Kunkleman,** 57, manager of western sales for **Bliss & Laughlin Inc.,** Chicago, died Jan. 28.

# Fast new Signode heavy-duty tool

Air power tensions 1¼" strapping fast, pulls as much as 3000 pounds of pre-set tension every time. Feed wheel permits unlimited take-up of slack.

**Saves at least this much strapping**

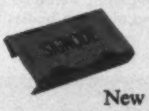
**every time it's used**

The FN-114 is the first air power feed wheel heavy-duty tensioning tool. It is fast and easy to use. In addition to saving time, it eliminates waste in the curl of strap which, until now, has been a necessary evil in applying 1¼-inch strapping with windlass type tools.

Additional savings come from the fact that the FN-114 takes strapping directly from the dispenser—takes out all the slack *before* the strapping is cut off by a quick stroke of the handle.

The FN-114—like other Signode heavy-duty tools—is available on an annual rental or single payment basis. Let us arrange a demonstration on your premises at your convenience. Just write or call. No obligation.

The powerful FN-114 holds the tension in the strapping while the operator applies the seal, using a Signode Model C tool. Signode heavy duty air-powered sealers are also available.



New 1¼" seal has open flange to permit fast, easy placement. This seal or regular thread-on seal can be lithographed with your company name, trademark, and colors.

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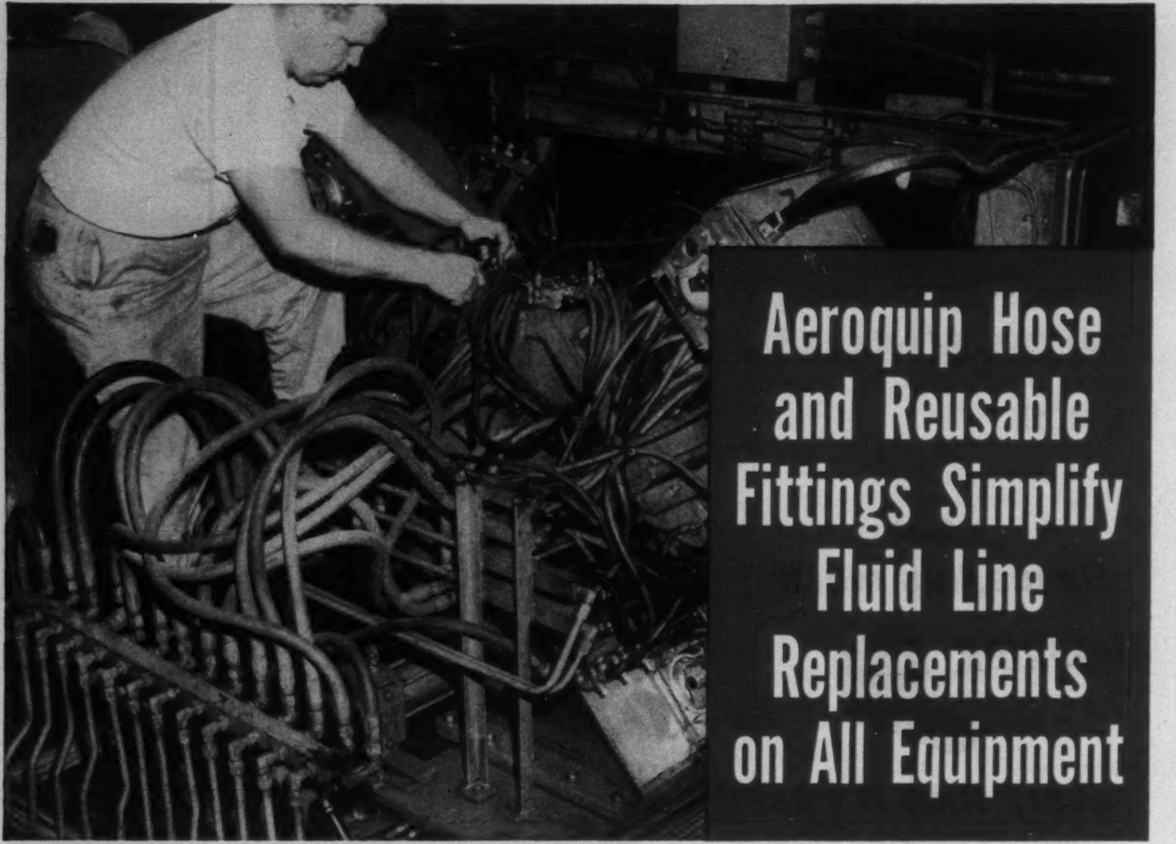

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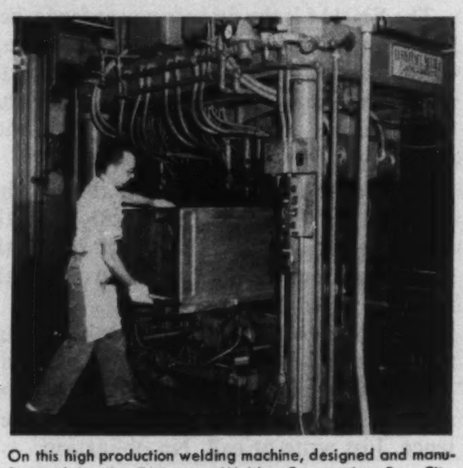
**They meet all installation requirements**—With a small inventory of Aeroquip Bulk Hose and Reusable Fittings, flexible hose lines of any length can be made up and installed quickly, easily.

**They assure dependable operation**—Because Aeroquip Flexible Hose Lines are rugged and durable, they help reduce machine downtime, maintain production schedules.

**Quick, low-cost maintenance**—Aeroquip Reusable Fittings are designed to be used over and over again to make up replacement hose lines as needed, greatly reducing hose line maintenance costs.

For valuable help by a hose line specialist, call your Aeroquip Distributor. He's listed under "Hose" in your Yellow Pages.



On this high production welding machine, designed and manufactured by the Resistance Welder Corporation, Bay City, Michigan, Aeroquip Hose Lines are used in hydraulic positioning of range bodies for welding.

Aeroquip

REG. TRADEMARK

**AEROQUIP CORPORATION, JACKSON, MICHIGAN**

INDUSTRIAL DIVISION, VAN WERT, OHIO • WESTERN DIVISION, BURBANK, CALIFORNIA
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# National Lets Contracts For $300 Million Project

NATIONAL STEEL CORP., Pittsburgh, has awarded additional contracts in its $300 million expansion program (STEEL, Aug. 3, 1959, p. 69, and Aug. 31, 1959, p. 59), scheduled for completion in 1962. The program includes construction of an entirely new steel finishing plant in Portage, Ind.; construction of oxygen plants at Great Lakes Steel Corp., Detroit, and Weirton Steel Co., Weirton, W. Va.; addition of 500,000 tons of ingot capacity at Great Lakes Steel; and improvements and additions to tin plate and cold rolled sheet facilities at Weirton Steel.

New contracts for facilities at the corporation's various subsidiaries have been awarded as follows:

- **Great Lakes Steel**—General piping for an 80 in., continuous, hot strip mill under construction, to Blaw-Knox Co., Pittsburgh.

Two, 3000 cfm air compressors, complete with 600 hp motors, to Ingersoll-Rand Co., New York.

Three, 60 in. by 240 in., automated roll grinders, to Farrel-Birmingham Co. Inc., Ansonia, Conn.

An electronic computer control and data logging system for the 80 in. hot strip mill, to Control Systems Div., Daystrom Inc., La Jolla, Calif. (STEEL, Feb. 8, p. 46).

- **Midwest Steel** — Supplying and installing roofing and ventilators and installation of siding for the entire plant, to Jamar-Olmen Co., Melrose Park, Ill. (Siding material will be furnished by Stran-Steel Corp., a National Steel subsidiary.)

A field erected boiler having a capacity of 280,000 lb of steam per hour, to Babcock & Wilcox Co., New York. Package type boiler having a capacity of 88,000 lb of steam per hour, to Erie City Iron Works, Erie, Pa.

Two, 2600 cfpm air compressors with 500 hp motors, to Joy Mfg. Co., Pittsburgh.

Two, 60 in. by 240 in. roll grinders, complete with electrical equipment, to Mesta Machine Co., Pittsburgh.

Two, 36 in. by 240 in. roll grinders and one, 28 in. by 192 in. roll grinder, complete with electrical equipment, to Farrel-Birmingham Co.

As announced last August, Wean Engineering Co., Warren, Ohio, was awarded contracts for a Halogen process, electrolytic tinning line and an 80 in., continuous, raw coil pickle line. Main electrical equipment for both lines will be furnished by General Electric Co., Schenectady, N. Y. High frequency, induction strip heating equipment for flow brightening on the tinning line will be furnished by Westinghouse Electric Corp., Pittsburgh.

Blaw-Knox will supply a cold mill for fracture of mill scale prior to pickling on the 80 in., continuous, raw coil pickle line.

Westinghouse Electric also has been awarded contracts for the complete electrical equipment for a 52 in., five stand, cold reduction mill furnished by Mesta Machine Co. and for the power distribution equipment for the entire Midwest Steel plant.

Allis-Chalmers Mfg. Co., Milwaukee, has been awarded the contract for complete electrical equipment for a 52 in., two stand, temper mill also being furnished by Mesta.

## Inland Adds Plating Line

Inland Steel Co., Chicago, is increasing its galvanized steel sheet production capacity 35 per cent. The firm is adding a fourth continuous galvanizing line to the three in operation at its Indiana Harbor Works, East Chicago, Ind.

The line is scheduled to go into operation early next year. It will coat coils up to 60 in. wide at a rate of 300 fpm and will have a rated annual capacity of 120,000 tons. The expansion will lift Inland's total annual capacity for galvanized sheets and coils to 460,000 tons.

Supplemental equipment incorpo-

*(Please turn to Page 106)*

*if*
**HEAT**
*is*
**YOUR PROBLEM**
*call*
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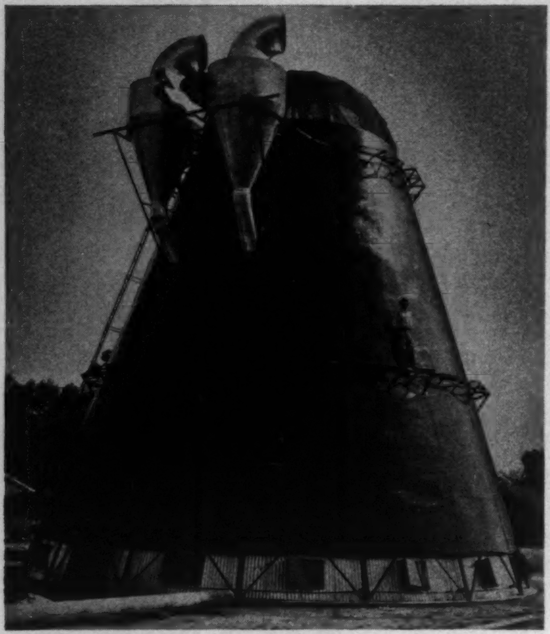
# ARMCO SPECIAL STEELS–
# LOW-COST ANSWERS TO



## Wanted: Resistance to heat
## Answer: Armco ALUMINIZED STEEL Type 1

This 40-foot refuse burner, lined with Armco ALUMINIZED STEEL Type 1, resists searing heat from burning wood chips and corn stalks. Makers of industrial incinerators and popular back-yard burners specify this special hot-dipped aluminum-coated steel because it greatly outlasts cold-rolled or galvanized steel in this punishing service.

For the same reasons, ALUMINIZED STEEL is widely used in mufflers, oven and furnace parts, and similar applications where combinations of heat and corrosion shorten life of other materials. This versatile steel is also specified for its combination of strength and heat-reflectivity in appliances, restaurant equipment, and related products.

...LERS CONTROLLE
...N THIS AREA
...Y PIV-1

## Wanted: Top-quality porcelain enamel finish
## Answer: Armco Enameling Iron

Bathtubs are drawn to a depth of 14 inches in one operation from ductile sheets of Armco Enameling Iron. Rejects stay low because this special metal is made for top performance in fabrication.

On the "firing line," too, Armco Enameling Iron minimizes defects. Freedom from impurities and resistance to sag help assure porcelain enamel products with flawless finish and close tolerances.

Summed up, "It's made *only* for porcelain enameling." That's why manufacturers of appliances, metal curtain walls, signs, and many other products specify Armco Enameling Iron for top-quality porcelain enamel finishes.

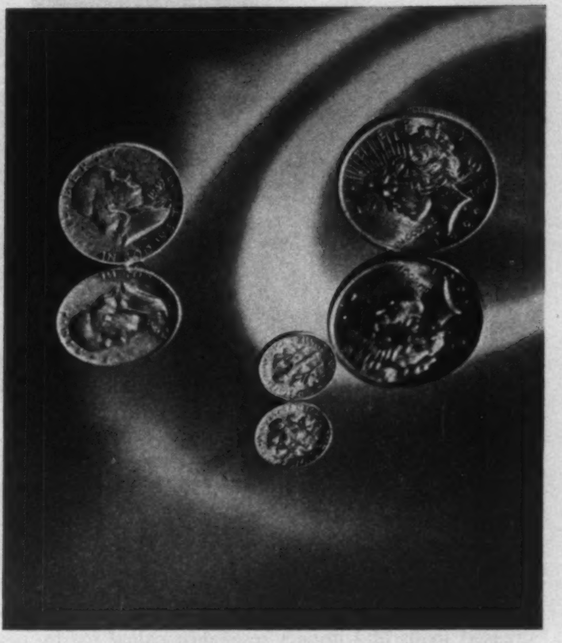
**ARMCO STEEL CORPORATION,** 1270 Curtis Street, Middletown, Ohio
Send me information on the following Armco Special Steels:
________________________________
________________________________
Name____________________________
Company_________________________
Street___________________________
City________________Zone____State______

Besides the grades described, Armco produces a wide range of other special steels for better products at lower cost. These include

- Armco ALUMINIZED STEEL Type 2
- Armco ZINCGRIP PAINTGRIP® Steel
- Armco High Strength Steel
- Armco Stainless Steels (Standard and special grades in sheets, strip, plates, bars and wire)
- Armco Electrical Steels
- Armco Welded Steel Tubing

New steels are born at Armco

# PRODUCT-PROBLEMS



### Wanted: Rust-resistance, simplified production
### Answer: Armco ZINCGRIP Steel

Replacement of die castings with Armco ZINCGRIP® Steel pays off four ways for a manufacturer of pressure tank air volume control valves (four center pieces in photo).

*Assembly goes fast.* Originally, two die-castings, diaphragm between them, were joined by bolts. Now halves are formed from ZINCGRIP Steel, diaphragm inserted, and halves joined by a reverse lockseam. *Design is simplified,* also. One valve of ZINCGRIP replaces four die-cast models. Though easier to assemble, it *costs less* and *performs better.*

Many manufacturers gain similar benefits with Armco ZINCGRIP — the rust-resisting steel that can be severely worked without flaking or peeling of its tight zinc coating.

### Wanted: Economical bright-finish strip
### Answer: Molding Quality Armco 17 Stainless

Three coins are easily mistaken for six when set on edge and mirrored in the bright Molding Quality Finish on Armco 17 (Type 430) Stainless Steel strip.

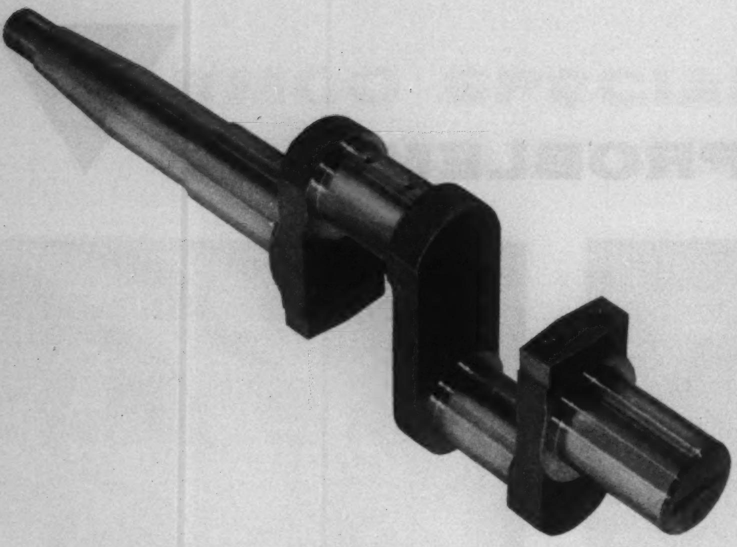
This high-luster finish is economical for product trim because it is a *mill finish.* Armco 17 strip is first rolled to precise thickness, then bright-annealed. In final tempering, special rolls impart the unique mirror-like quality of Armco's Molding Quality Finish.

On many formed items, the brightness of Armco Molding Quality Finish minimizes costly buffing. In addition, economical Armco 17 Stainless strip is easy to color-match with other trim materials.

## ARMCO STEEL

ARMCO ®

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation



DUCTILE IRON SAVED MONEY

This seventy pound ductile iron crankshaft was made for air compressors manufactured by The Brunner Division of Dunham-Bush, Inc. The increased loads and impact resistance called for by new compressor design specifications required rigidity and strength beyond the limits of the cast iron alloy shafts formerly used. Ductile iron was chosen because the rigidity, yield strength and wear characteristics comfortably exceed operating requirements.

A major cost advantage was realized in this case. Hamilton Foundry used existing pattern equipment made for the gray iron crankshafts in the switch to ductile iron. This saved the cost of new foundry patterns and the greater cost of dies needed for steel forgings. Dunham-Bush achieved a major improvement in product performance for the modest additional cost of the metal in the castings.

When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

HAMILTON FOUNDRY INC.

1551 LINCOLN AVENUE • HAMILTON, OHIO • TWInbrook 5-7491

*(Concluded from Page 103)*

rated in the line will permit the substitution of aluminum coating for zinc, Inland's first facility for making aluminized sheets.

## J&L Orders Soaking Pits

Jones & Laughlin Steel Corp., Pittsburgh, has awarded contracts to Amsler Morton Co., Pittsburgh, for soaking pits at its Cleveland Works. The new facilities will include two rows of two hole soaking pits, replacing obsolete units. Cost: About $900,000. The first row will be completed in about six months.

This is the second phase of a soaking pit replacement program started in 1957 when J&L put into operation two batteries of four pits and one battery of two pits. All the new pits are 9½ ft wide, 27 ft long, and 13½ ft deep. Ten other slightly smaller soaking pits are also operated at the Cleveland Works.

Stock and equipment capacity of J&L's Steel Warehouse Div. steel service center north of Cincinnati will be almost tripled when a 100,000 sq ft addition is completed this summer. George L. Stewart is president of the division. H. B. Asquith is manager of the Cincinnati service center; G. B. Highland, assistant manager.

## Wheeling Shifts Units

Wheeling Steel Corp., Wheeling, W. Va., has launched a $5.7 million improvement program to be completed this year, says P. W. Koenemund, vice president in charge of operations.

Immediate steps will be taken to move its long terne sheet line and silicon sheet, silicon strip annealing, and core plating facilities from the Beech Bottom (W. Va.) Works to the Follansbee (W. Va.) department of the Steubenville (Ohio) Works. Purpose of the move: "Make Wheeling more competitive in the market for electrical steels."

The Steelcrete factory at Beech Bottom will become a major center for factory and fabricating operations of the corporation. New installations will include a continuous, 48 in., strip painting line and a high speed roll forming and shearing line for the manufacture of roof

## IMMUNIZE METAL against rust • against corrosion with

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## Get Better, Faster, Safer Metal Protection

IMMUNOL provides outstanding benefits in tumbling and other metalworking operations as a detergent, rust preventive and wetting agent. It saves thousands of dollars per year for one major aircraft producer tumbling stainless steel jet engine blades. In another application, IMMUNOL saves $700 per week over vapor degreasing and, IMMUNOL used 1 to 17 parts water at room temperature without agitation, replaced a flammable solvent to give clean, rustproofed surfaces at reduced cost without fire hazard or odors.

To I-M-M-U-N-I-Z-E against rust and corrosion in any process where water contacts metal, use IMMUNOL, the *safe* non-flammable, non-toxic, odorless cleaner and rustproofing agent. IMMUNOL is proved by over 15 years of wide, practical use and it:

**LEAVES A DRY, INVISIBLE, LASTING RUSTPROOF COATING**

as it cleans, eliminating corrosion problems that could hold up production. Protected parts do not interfere with electronic separators in automation and parts can be painted over.

**REPLACES MORE EXPENSIVE, LESS EFFICIENT CLEANERS,**

alkalies and solvents. Only a few ounces of IMMUNOL per gallon of water are required to produce a gallon of solution—a solution that can be used over and over again.

**ELIMINATES THE FIRE HAZARD OF SOLVENTS**

since it is non-flammable. You can use IMMUNOL safely anywhere in your plant. It is non-toxic so operators can use it without fear of dermatitis, toxicity or skin irritations.

*There are specific grades of IMMUNOL for cleaning and rustproofing all metals. Write, wire or call giving us your application and we will send you a free sample for test purposes and a booklet describing the many outstanding results users have obtained with IMMUNOL.*

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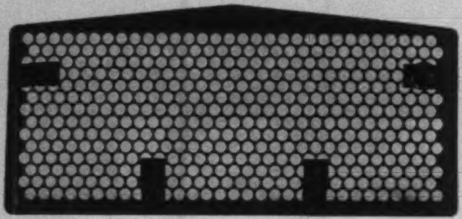
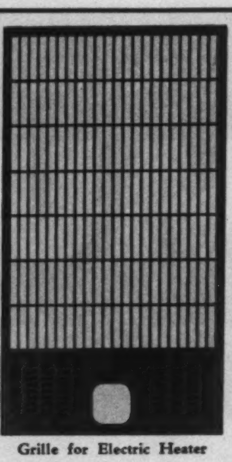


Rodent Guard for Electric Motor



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For nearly half a century we have been furnishing perforated metal sheets, plates and parts to manufacturers of industrial equipment and household appliances, at lower cost than if the work were done in their own shops. No magic — just because we are especially equipped and organized for that type of work.

Let us quote on YOUR requirements. When given sufficient information, our experienced engineers are often able to make money-saving suggestions and always welcome an opportunity to do so.

Our new 32-page catalog illustrates a great variety of perforated metal patterns and gives complete working data. Also shows many modern applications. Write for Catalog 59. No charge or obligation.

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Manufacturers of DIAMOND Perforated Metal Panels for Modern Acoustical Ceilings.

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deck sections. Other roof deck equipment will be moved from the former Wheeling factory to the Steelcrete plant.

The program includes the eventual shutdown of the Ackermann factory in Wheeling. Products made there include pressed and drawn stampings used mainly by the automotive, appliance, and other metalworking industries. Mr. Koenemund gives two reasons for the decision: "The manufacturers who have been our customers are gradually taking over the production of stampings in their own plants; and, second, our wage rates, pegged at steel mill levels, do not allow us to be competitive in this field."

## Sylvania to Build Plant

Sylvania Electric Products Inc., a subsidiary of General Telephone & Electronics Corp., will construct an 18,000 sq ft weld plant on Lexington Avenue, Warren, Pa., for its Parts Div. The division produces wire, welds, and metal and plastic parts.

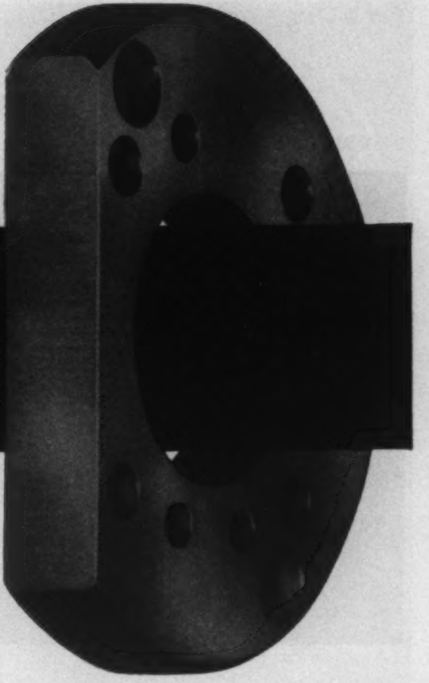
## Canton Malleable Expands

Canton Malleable Iron Co., Canton, Ohio, a subsidiary of Penn Machine Co., has completed a $350,000 plant expansion and modernization program. New facilities include a cupola type melting furnace, annealing ovens, and modern conveyor lines which increase production capacity from 35 to 100 per cent in various operations. The firm specializes in the manufacture of medium weight malleable iron castings and also produces aluminum, brass, and bronze castings.

## Enters Wire Mesh Field

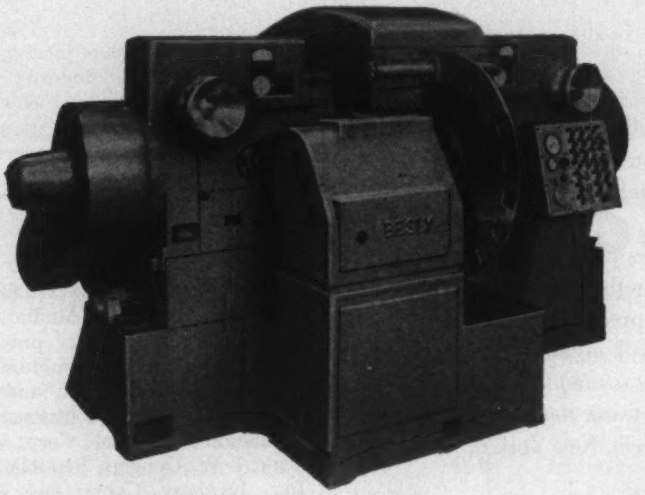
Southeast Steel & Wire Corp. has been established in New Orleans, announces Kurt Orban, chairman. The company will produce welded wire reinforcement mesh and wire and steel products for the building industry. A manufacturing plant with a production capacity of about 1000 tons a month will be constructed. Albert Baldwin Jr. is vice president in charge of manufacturing. Other officers are: President, Arthur Nichols; vice president, Joseph Reagan; treasurer, Hugo Rothschild; and secretary, A. A. Pat-

*How's this for accurate grinding?*



Very dense cast iron COMPRESSOR CYLINDER, 3⅞" dia. x ½" was *production ground* by a BESLY DH4 grinder to ± .0001" of size and .000050" of flatness and parallelism. Stock removed was .0014" to .002". Finish was 8 micro-inch. Rate of production: 240 cylinders per hour. *Tolerances exceeded specifications by more than 100%!*

# If your grinding equipment can't turn out such results... **Better see Besly!**



*BESLY DH4 double horizontal spindle disc grinder.* Has *exclusive* precision quill and clutch infeed that provides feed increments calibrated in *millionths*. Abrasive discs can be changed in 30 minutes without disturbing setup, *cutting downtime in half*. Dressing time is only four minutes, *1/5 the usual time!* Simplified push-button operation and controls, built-in dials, gages and meters to indicate abrasive conditions, movement and alignment, motor load, etc., assure precise results, dependable grinding production.

*Get all the facts. Write for the Besly DH4 Bulletin, Now!*

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**"RUSTRIPPER" gives you the "universal" tank cleaner . . . removes rust, scale, paint, soils**

Here is a remarkable alkaline material with powerful cleaning and chelating action. It conquers a wide variety of soils. In a tank of Oakite RUSTRIPPER, you can remove scale and rust with complete safety. It strips tough paints and phosphate undercoatings with ease. It cleans off metallic smuts, light shop soils, discolorations.

Look at its performance in shop service: "Aircraft parts freed of scale with boiling soak, instead of sand blasting" . . . "oil, welding flux, rust removed in job plating" . . . "soaked steel wrenches give brighter plate" . . . "removes all rust, scale, carbonized oil from diesel liners prior to plating" . . . "displays amazing solution life even though worked very hard" . . . "eliminates pickling and precleaning for barrel-plated screws" . . . "does to bolts in 3 minutes what took pickling 40 minutes". *And that's just a sample.*

Write for Bulletin 9651. Better yet, ask the Oakite man. Oakite Products, Inc., 28A Rector Street, New York 6, N. Y.

*it PAYS to ask Oakite*

OAKITE

*over 50 years' leadership in industrial cleaning* *Est. 1909* SCIENCE

terson. They are associated with Florida Wire Products Corp., Miami, and Southwest Wire Products Corp., Dallas, producers of concrete reinforcement wire mesh.

## Buys Copper Rod Mill

Continental Copper & Steel Industries Inc., New York, is installing a copper rod rolling mill at the Linden, N. J., plant of its Hatfield Wire & Cable Div. The work is being done under contract with Loewy-Hydropress Div., Baldwin-Lima-Hamilton Corp., New York. The project is part of a $10 million expansion and modernization program at Hatfield's facilities.

## Southern Steel Adds Line

Southern Steel & Stove Co., Richmond, Va., purchased the inventory, tools, dies, and machinery of Spark Stove Co., Oakland, Calif. About 20,000 sq ft of manufacturing space has been added to the Richmond plant for production of Spark oil heaters.

## ASSOCIATIONS

**Gray Iron Founders' Society Inc.** and **Designers for Industry Inc.**, Cleveland, are offering a co-operative iron casting service to metalworking industries. It covers design, specifying, cost reduction, research and development, and associated technical areas.

**Aluminum Association,** New York, elected these officers: Chairman, S. D. Den Uyl, Bohn Aluminum & Brass Corp., Detroit; president, M. M. Anderson, Aluminum Co. of America, Pittsburgh; and vice presidents, N. H. Collisson, Olin Mathieson Chemical Corp., New York; J. W. Douglas, Republic Foils Inc., Danbury, Conn.; and T. D. Gebhart, Anaconda Aluminum Co., Louisville. Chairmen of the commodity divisions are: Aluminum Electrical Conductor Div., R. L. Williamson, Rome Cable Corp., Rome, N. Y.; Aluminum Extruded Products Div., J. W. Watson, Kaiser Aluminum & Chemical Corp., Oakland, Calf.; Aluminum Foil Div., J. S. Hamilton, Aluminum Co. of

(*Please turn to Page* 114)

DESIGN
WITH *WELDED*
TUBING

# WELDED STEEL PRESSURE TUBING

## UNIFORMLY ROUND, DEPENDABLY SOUND—readily shaped and assembled

For every designer, the many thousands of miles of welded steel tubing in boilers, heat exchangers, evaporators and condensers throughout America prove these facts: welded steel tubing has dependable strength (*what pressures do you need?*) . . . it is easily formed (*are special shapes your problem?*) . . . it is accurately concentric (*will you use more drilled holes than a steam drum?*) . . . and has no hidden interior imperfections (*the rolled steel from which welded tubing is made is sound and smooth*).

These are reassuring facts to count on, whatever your product where tubing is used. They mean easier fabrication at lower cost, together with complete dependability in performance on the job.

Great design freedom is provided by the wide range of carbon and stainless grades at your command in welded steel tubing. Write for data-filled Bulletin 8591—and for immediate information on your current requirements, call a quality welded tube producer.

LC-603

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**1604 Hanna Building, Cleveland 15 Ohio**

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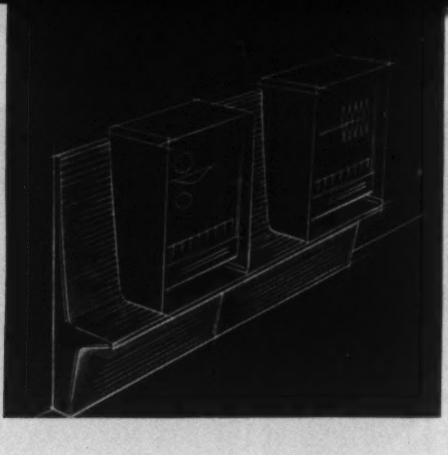


# SHARONART*

**a new idea in steel . . . sparks a new idea in**

*Famed designer Peter Schladermundt creates new machine concept using New Sharon Steel.*

Vending machines can now stay brighter, newer, longer . . . thanks to amazing new Sharonart*.

Believing few machines are subject to the abuse received daily by the vending machine, nationally famous designer Peter Schladermundt recognized the many advantages Sharonart* would impart to this hard working equipment.

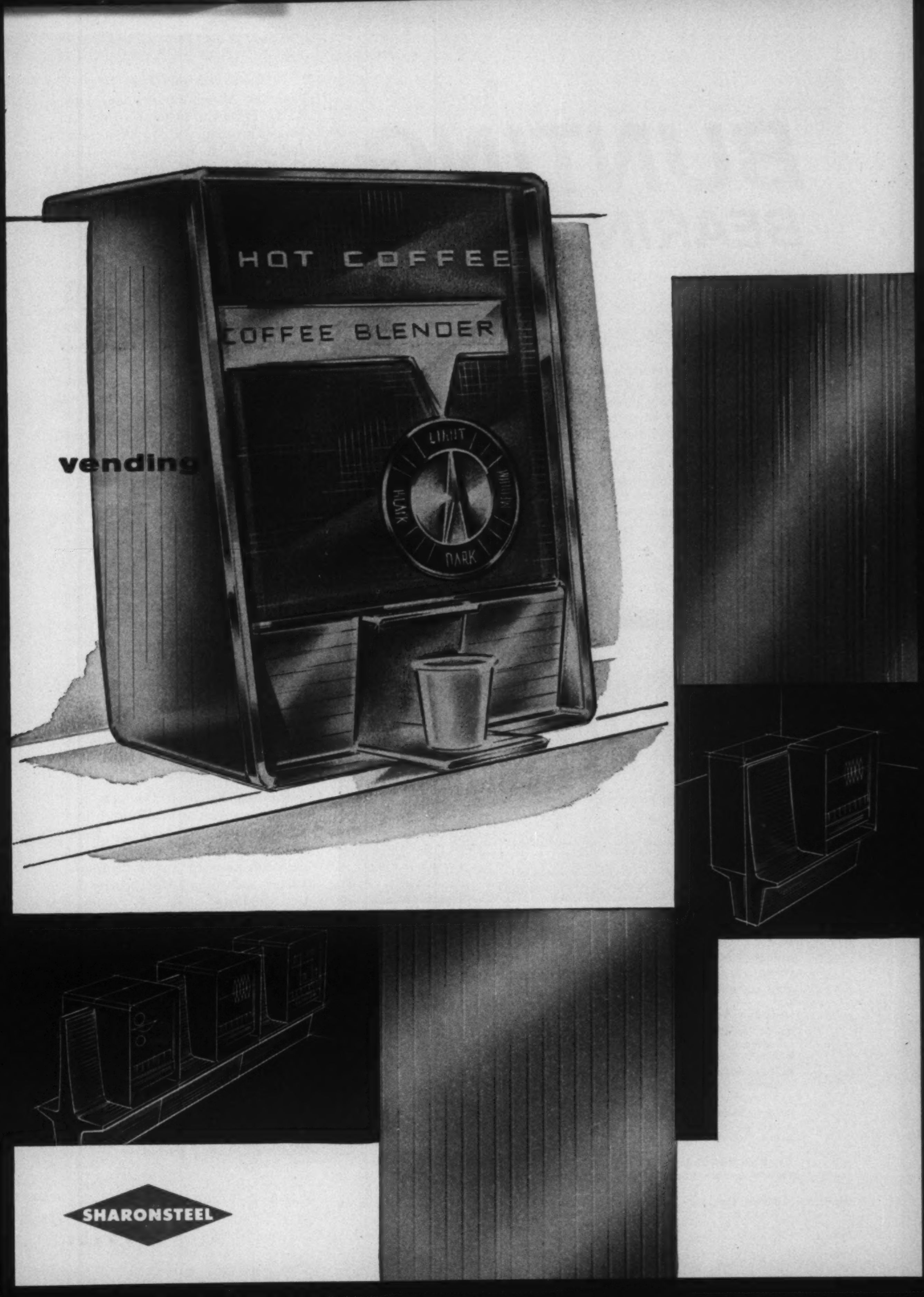
Sharonart* is patterned steel at its finest . . . and the many pattern combinations present a new plateau for the machine designer. He can now make model changes simply by altering steel patterns. But more important, Sharonart* resists marking and now vending machines will be able to absorb much more punishment without losing their attractiveness. Too, with modern painting techniques, manufacturers are able to achieve smart, new color combinations to give their product even greater beauty and sales appeal.

Wherever functional beauty and long life are desired, Sharonart* is the one perfect metal. For additional information write Sharonart, *Sharon Steel Corporation, Sharon, Pa.*

*Aside from designing the vending machine of Sharonart*, Peter Schladermundt has created an entire new process of machine vending. By developing special racks, machines can be easily added and removed according to demand, and/or for refilling. Rack could be made as a fixed wall type, or as an island, with machines operated from both sides. Machines could be hung individually or doubly, saddle style.*

**Note: The vending machine idea illustrated on these pages is not now a manufactured product. It is a design only.** *TM

**SHARON** *Quality* **STEEL**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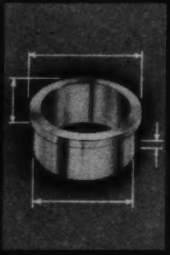
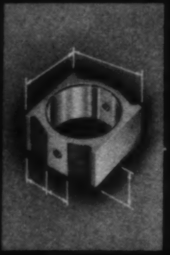
. . . case in point *

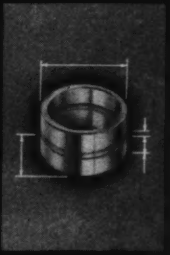
*Clearly evident is the economy in the production of this shifter fork by Bunting Powder Metallurgy. The elimination of practically all machine work effects striking cost reduction.



*This cylinder gland bearing made of Bunting Bearing Aluminum is an example of how to save weight and money on the cost of large, thick-wall bearings and parts.



*This cast bronze cam block, made to unusually close limits with very fine finish, is absolutely round and true to size with cost at a feasible figure.



*Solid cast aluminum gear bearing to replace roller bearing for longer life and lower cost.

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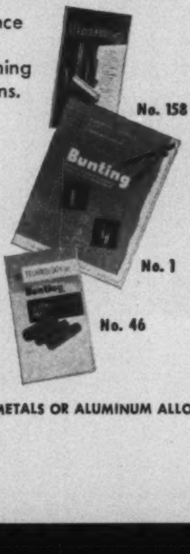

BEARINGS, BUSHINGS, BARS & SPECIAL PARTS OF CAST BRONZE SINTERED METALS OR ALUMINUM ALLOYS

(*Concluded from Page* 110)

America; Aluminum Foundry Div., A. L. Fischer, Fischer Casting Co. Inc., Dunellen, N. J.; Aluminum Rolled Bar & Rod & Wire Div., D. B. Miller, Aluminum Co. of America; and Aluminum Sheet Div., R. T. Farrell, Fairmont Aluminum Co., Fairmont, W. Va.

## NEW PLANTS

**Fort Duquesne Steel Co.,** Pittsburgh, is operating its new branch distributing plant in Elizabeth, N. J. H. B. Hollingshead is district manager for the New York metropolitan area. A 48 in. slitting line features a wide assortment of steel processing equipment.

**Interstate Steel Co.,** Evanston, Ill., is building a $1.1 million warehouse and office at 401 Touhy Ave., Des Plaines, Ill. The 83,000 sq ft facility will have a capacity of 25,000 tons of steel.

**Techalloy Co. Inc.,** Rahns, Pa., completed construction of a plant on the outskirts of Union, Ill. Cost of plant and equipment: $1 million. The firm makes wire, rods, strip.

**Computer Systems Inc.** (formerly Mid-Century Instrumatic Corp.), New York, is building a 30,000 sq ft plant at Monmouth Junction, N. J. The firm makes analog computers, simulators, and accessories.

**Sarasota Precision Products Inc.** opened a plant at 5757 McIntosh Rd., Sarasota, Fla. Larger facilities were required to meet increased demands for the firm's hydraulic valves and to provide capacity for new products.

## NEW ADDRESSES

**Pickands Mather & Co.,** Cleveland, moved its pig iron and coke sales office from Washington to 30 Rockefeller Plaza, New York. District representatives are Ben J. Roth and W. R. Alley.

**Bay State Abrasive Products Co.,** Westboro, Mass., moved its branch office and warehouse to 9550 Granger Rd., Cleveland 25, Ohio. George H. Smith is district manager.

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| **ALCLAD 2024** | Flat Sheet: O, F, T3, T36 & T86 | 3" to 60" | 24" to 288" depending on thickness |
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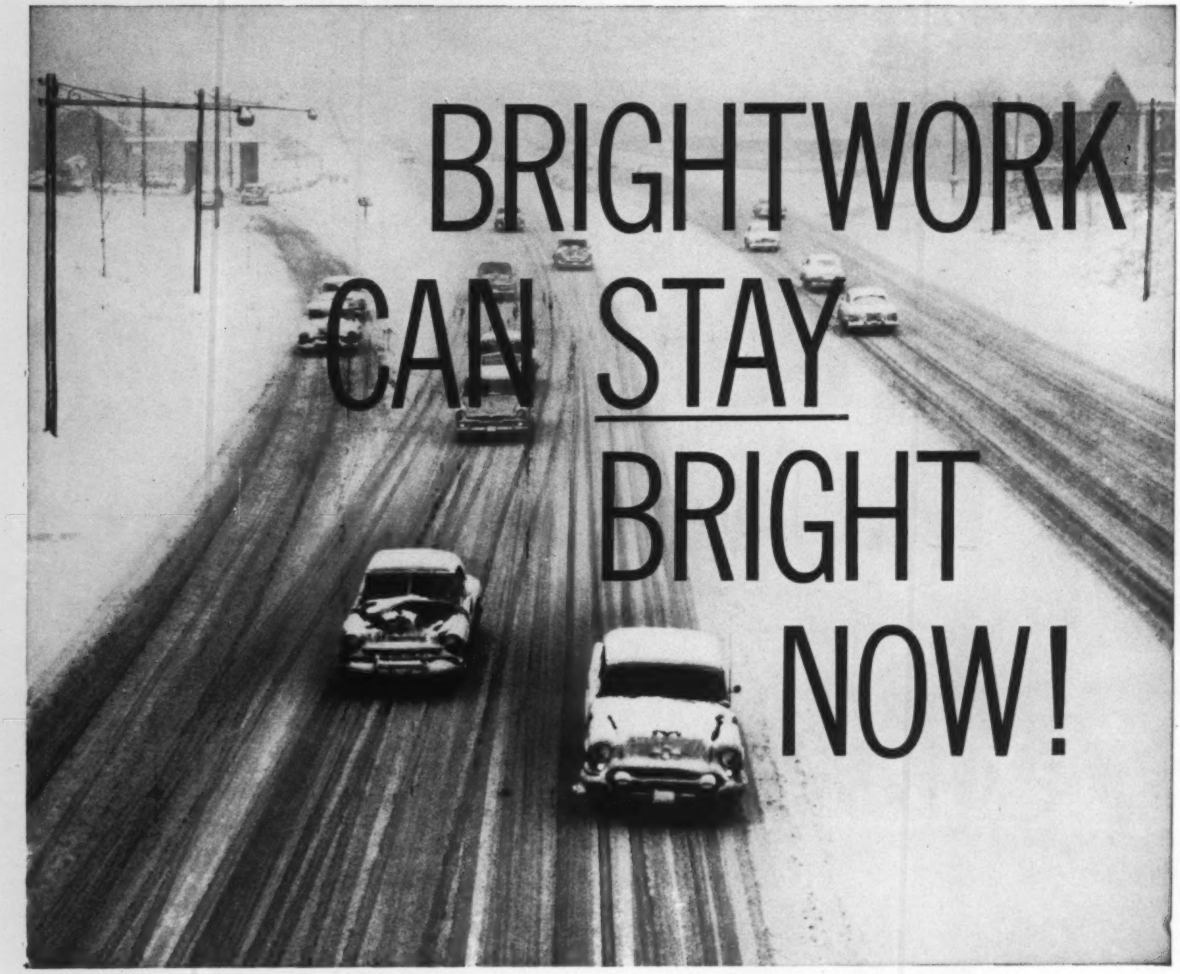

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# Technical Outlook

**TURBINE DRIVES PRESSES**— Patents have been issued on a gas turbine drive for heavy forming and extrusion presses. Commonwealth Engineering Co. of Ohio, Dayton, Ohio, reports the simplified drive produces greater forces than is possible with present equipment. Control is easy: Meter the fuel to the turbine. Biggest potential: Outsize parts.

**MORE CONVERTERS COMING**— Late this year, two 100 ton oxygen steel converters will go into operation at the Pueblo, Colo., plant of Colorado Fuel & Iron Corp. The vessels, supplied by a German company, will be installed by H. K. Ferguson Co., a division of Morrison-Knudsen Co. Inc., Cleveland.

**CUTS WELDING COSTS**—An electronic control and power system is said to reduce the power needs of conventional resistance welders. Robotron Corp., Detroit, calls its development "spike power welding."

**PUTS TUNGSTEN ON GRAPHITE**—Experimental rocket nozzles of graphite are coated with tungsten (up to ⅛ in. thick) by Alloyd Corp., Cambridge, Mass. Vapor phase deposits involve hydrogen reduction of tungsten hexachloride. Coatings are said to be quite adherent.

**CERAMIC DIES**—A tough alumina refractory makes good forming dies for severe abrasive situations at high temperatures, says Carborundum Co., Niagara Falls, N. Y. Strength and toughness are maintained at nearly 2000° F.

**MONSTER TOWER**—Our Saturn missiles will employ a 31 story, 2000 ton tower on wheels, says Kaiser Steel Corp., Fontana, Calif. It has $4 million to complete the project late this year.

**TANKS HAVE NO BOTTOMS**—A clever crew designed an aluminum offshore oil storage vessel which has no bottom. The 1000 gallon, inverted, conical tank is almost completely submerged—sea water supports the dead weight of the oil above permitting lighter construction. Four braced legs anchor the structure to the sea bottom, says Reynolds Metals Co.

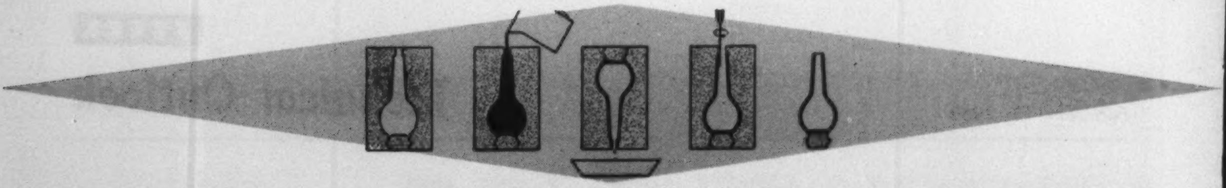
**RECLAIMS TITANIUM SCRAP**—Induction melting and casting is a good way of reclaiming titanium alloy scrap, says Watertown Arsenal. Properties are said to be almost equal to those of forged titanium. (PB151572, OTS, Department of Commerce, Washington 25, D. C.—50 cents.)

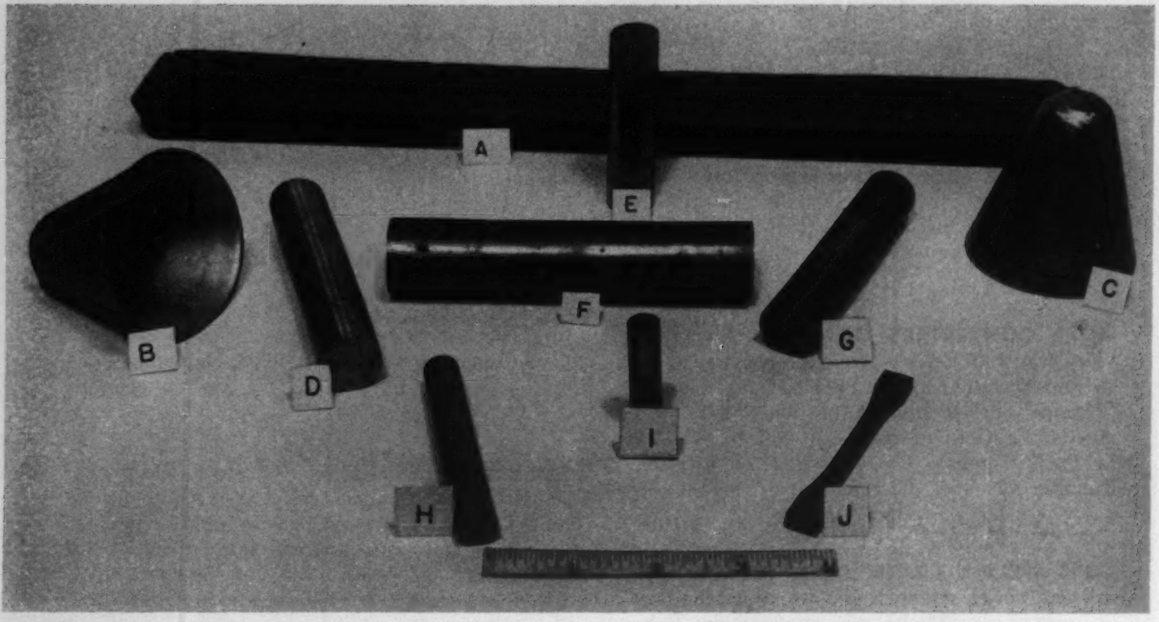
**SEISMIC SALES HELP**—Portable electronic equipment helps builders select steel requirements by defining underground structure and materials. Its a sales tool used by Acme-Newport Steel Co., a subsidiary of Acme Steel Co., Newport, Ky. Equipment comes from Geophysical Specialties Co., Minneapolis.

**ELECTRICAL DAMPING**— Vibration in the skin of airplanes could be cut with electromagnetic induction, suggests Lloyd B. Cherry, Lamar State College of Technology, Beaumont, Tex., who explained his proposal at an American Institute of Electrical Engineers meeting in New York. The object: Prevention of premature metal fatigue.

**MINIATURIZATION PUSHES ON**— A detector for nuclear radiation is smaller than the head of a pin. It's an almost invisible piece of doped silicon, says Hughes Aircraft Co., Culver City, Calif., which lists these improvements over previous types: It is 1000 times faster; accuracy is within 0.5 per cent; it is cheaper.

**HALF-ROUND HONEYCOMB**— A honeycomb panel shaped like a half cylinder (180 degrees) replaces three, 60 degree pieces in the B-58 nacelle and weighs up to 8 lb less, says Convair Div., General Dynamics Corp., Ft. Worth, Tex. When Convair learned how to heat and cool the panel quickly, the improvement followed, states Frank Darby, senior design engineer.





Shapes formed by slip casting illustrate flexibility. The tungsten heat treating boat (A) would have required a large press. B and C are cones with varying thickness; E and I are thin walled tubes

# Slip Casting Technique Widens Powder Metallurgy

### Pure and mixed powders are used. Plaster molds replace presses and steel dies, offering economies on short runs or experimental production. Parts have good density

HENRY H. HAUSNER
Consultant to Sylvania Electric Products Inc.
ARNOLD R. POSTER
Head, Powder & Parts Dept., Sylvania Electric Products

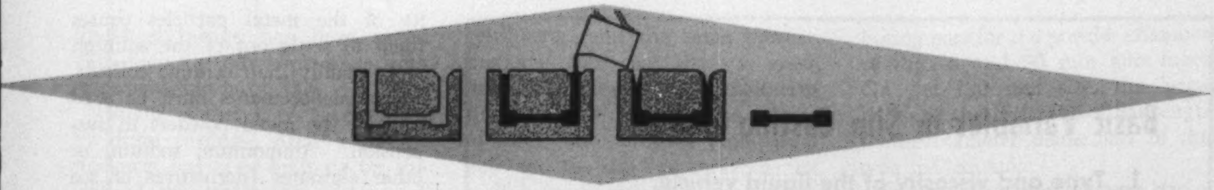
SLIP CASTING (STEEL, May 19, 1958, p. 162) is being used in the production of short run and unusually shaped powder metal parts. Compared with press compacting, it removes size limitations and permits the formation of hollow parts, or shapes with thin or tapering walls.

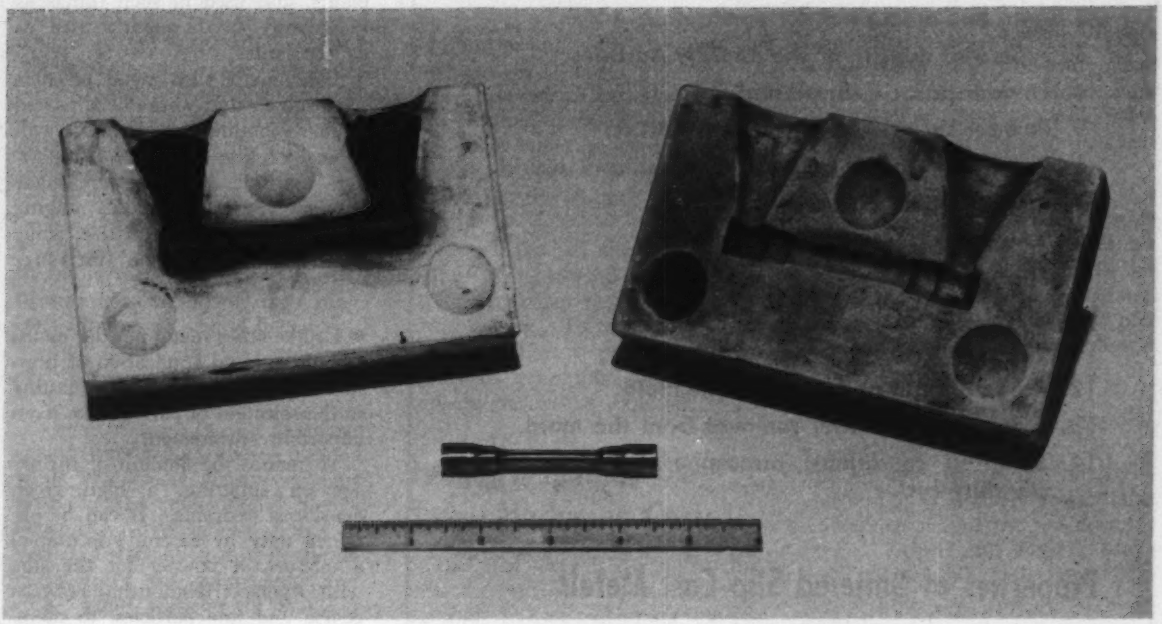
The process, which has been investigated by metallurgists for several years because of the simple plaster molds required, allows use of powders with poor compressibility. By eliminating the machining costs required by steel dies, it cuts the time and expense required for production of prototype or short run parts. Quality does not suffer despite the simplicity of the equipment used.

The process involves these steps:

- Production of suitable slip or slurry consisting of liquid and solid components.
- Casting the slip into a porous mold, frequently made of plaster of paris.
- Absorption of the water from the slip by the mold to form the green part.
- Removal of the semidried part from the mold and final drying.
- Heat treatment (sintering) of the part to obtain the final physical properties.

**• For many decades the slip cast-**





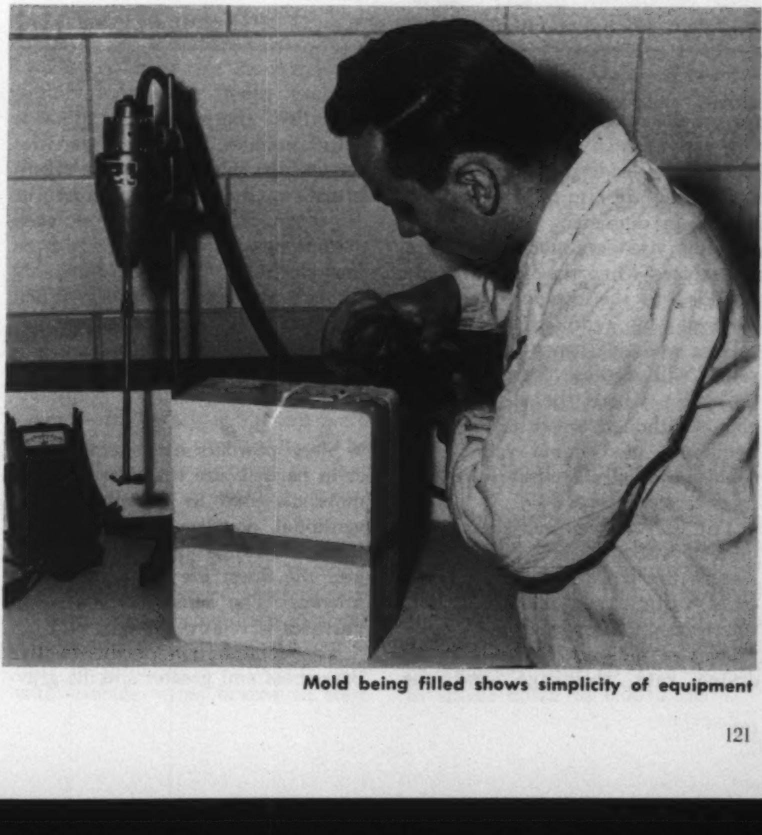
**Green casting is shown in opened mold. Risers provide additional slip as liquid is absorbed. The sample, after removal of the risers, sintering, and final heat treatment is shown below the mold sections**

**ing process has been industrially important in molding ceramic materials.**

Among the ceramic slip cast products are chemical and sanitary ware, insulators of various types, art figurines, and table china.

There are many similarities between the slip casting of ceramics and metals, but the handling of metals requires modifications in the ceramic techniques. Further innovations may be expected as applications develop. Here's a brief review of the ceramic process:

The slip is a colloidal suspension of ceramic powders in an electrolyte solution. The viscosity of the slip must be closely controlled and is related to the pH value (alkalinity or acidity) of the liquid. The ceramics engineer uses naturally occurring clays or claylike materials, such as kaolinite or a variety of metallic oxides, all of extremely small particle size. The hexagonal plates which make up the particles in clays



**Mold being filled shows simplicity of equipment**

## Basic Variables in Slip Casting Process

1. **Type and viscosity of the liquid vehicle.**
2. **Type and amount of deflocculant.**
3. **Type and density of the powder particles.**
4. **Powder particle shape and porosity.**
5. **Powder particle surface characteristics.**
6. **Reaction, if any, between powder and liquid.**
7. **Ratio of solid to liquid.**
8. **Amount of air entrapped in the slip.**
9. **Slip viscosity.**
10. **pH of slip.**
11. **Temperature of slip.**
12. **Rate of liquid absorption in the mold.**
13. **Rate of drying after removal from the mold.**
14. **Sintering conditions: atmosphere and time-temperature cycles.**

## Properties of Sintered Slip Cast Metals

| | Molybdenum | Type 316 Stainless |
|---|---|---|
| Density, g/cc | 10.1 | 7.87 |
| Ultimate Tensile, psi | 45,000 to 60,000 | 70,000 to 78,000 |
| Elongation, per cent | 3 to 7 | 55 to 57 |

are usually less than 0.1 micron in thickness and 0.5 micron in length. Most of the oxide particles used for slip casting are also of less than 0.5 micron in diameter.

A low viscosity, mudlike mixture is produced when the liquid vehicle is added to the powdered ceramic material, but addition of deflocculants and adjustment of the pH values will regulate the viscosity to the point where the slip is castable. Although water is the most frequently used liquid vehicle, alcohol—especially ethyl—can be used in some cases.

The users of ceramic slips determine: Viscosity, pH, the settling rate of the powder, draining properties, casting rate, and other characteristics. Knowledge of those properties aids in controlling the drying rate, shrinkage, and the strength of the product.

In ceramics, the solid particles are usually held in what the chemist calls a true colloidal solution, or dispersion. The surface of each particle has absorbed a charge from the electrolyte solution, probably through a double ion layer. When observed under the ultramicroscope, the particles are in a constant Brownian movement typical of such colloids.

● **Metal powders are generally larger in particle size than the colloidal materials used in ceramics. Conventional powder metallurgy particles will range up to 100 microns, and the finest are seldom below 1 micron. The density of the metal particles is relatively high.**

The combination of the relative coarseness and greater specific gravity of the metal particles causes them to settle out of the solution more readily than ceramic colloids. Special deflocculants must be used to hold the metal powders in suspension. Ammonium, sodium, or other alginates (derivatives of sea plants, also used in such things as ice cream) are frequently used as deflocculants.

Experiments with metal powders have shown that workable slips can be made; optimum particle size will depend on the nature of the powder. Satisfactory slips were made with molybdenum powders ranging from 1 to 20 microns in size, while with stainless steel the size range was 30 to 100 microns.

● **Unlike other metal powder methods, there is no application of pressure for compaction in slip casting so the selection of particle size is an important requirement.**

To reduce the amount of shrinkage on sintering, a high green density is desirable. It can be obtained only by careful selection of a mixture of powder for the slip, with a correct relationship between coarse and fine particles, to maintain a high packing density. Close control of all variables is essential to success. The slip is complex, but slip studies are basic. Components must also be considered for any effect they may have in subsequent sintering or use of the parts.

● **Casting generally amounts to pouring the prepared slip into a plaster of paris mold.**

Mold characteristics have a major bearing on the process. While plaster of paris is generally an excellent mold material, the condition of the mold at the time of casting must be taken into account. The plaster tends to hold some moisture; control of the moisture level of the mold is required if best results are to be obtained, and the optimum level is critical.

Although plaster is the most common mold material, some success has been experienced with other absorbents, such as papier-mache or even porous cardboard. Absorbency is important, since the liquid vehicle is absorbed into the capillaries of the mold material until a rigid body is formed.

There is some shrinkage during mold drying. As high as 1 per cent linear shrinkage has been noted with high viscosity slips made from extremely fine powders.

Hollow shapes may be obtained by drain casting. After a certain thickness has been built up on the wall of the mold, the center and still liquid slip is poured out. (A similar practice is used in ceramic hollow ware, and in the "slush casting" of metals.) The thickness buildup on the wall of the mold is determined in part by the nature and preparation of the mold and in part by the chemistry of the slip.

**• The part is allowed to remain in the mold to remove as much moisture as possible. Time may range from minutes to several hours.**

After drying in the mold, the part is removed and further dried—in air or a low temperature oven.

The green density of a dried part is surprisingly high due to packing, while the green density of parts made by the conventional method depends to the largest extent on particle deformation during the application of the compacting pressure. Finer particles fill the voids between coarser ones, if size distribution is correct. Friction between the powder particles is overcome by the lubricating action of the liquid vehicle in the slip.

Powder particles do not deform in slip casting, as they do in pressure compaction, nor is there a change in the nature of voids in the green casting. Result: A more uniform grain structure and the elimination of any orientation of grains or grain boundaries.

**• The dried, slip cast part is sintered under conditions which are identical with those used for pressure compacted parts of the same metals.**

During sintering, the bond between the metal powder particles is strengthened, and the part is densified. The sintering treatment is continued until the desired physical properties are obtained.

Although no pressure is used in slip casting, the shrinkage during sintering is about the same as that for conventional press compacted parts and is far less than would be expected from loose powders. Fine molybdenum powders can be pressure compacted at 20,000 psi to a green density of 5.8 grams per cubic centimeter, and the same powder, properly slip cast, has a green density of 5.7 grams per cubic centimeter. After sintering, the density of both the pressure compacted part and the slip cast molybdenum is 10.1 grams per cubic centimeter. Slip cast specimens having sintered densities equal to 97 per cent or more of theoretical can be produced. Tungsten has been slip cast and sintered to a density of 18.7 grams per cubic centimeter, with a sintering temperature only about 50 per cent of the melting point of the metal.

Experience has shown that flat plates 20 in. long, 2 in. wide, and ¼ in. thick can be slip cast without difficulty. To pressure compact the same shape a press with a capacity of more than 1200 tons of capacity would be required.

## Tungsten Carbide Bar Saves Machining Costs

Tungsten carbide's rigidity and resistance against deformation saved $10,700 in a machining operation at Watervliet Arsenal (Watervliet, N. Y.). A 64½ in. boring bar made of this material made the saving in machining the first 100 powder chambers of the 120 mm, M58 gun tube. The bar (about 500 lb) was made by Kennametal Inc., Latrobe, Pa.

The company says the material is suitable for other tools, such as grinding quills.

**• Advantages**—Greater rigidity permitted a smaller bar diameter and eliminated a chip flow problem. Speeds, feeds, and depth of cut were increased. The bar is versatile. It can be be used to contour bore the powder chambers of several different gun tubes. The tungsten carbide bar eliminated the hazards of handling a 200 lb contour form reamer after every ten pieces were machined. A 63 rms finish can be produced; in some instances, that would eliminate a grinding operation.

Until recently, Kennametal says, it was necessary to use a specially contoured high speed steel reamer on the powder chambers. Arsenal tool engineers experimented successfully in stiffening steel boring bars with carbide strips brazed in steel boring bars for the powder chambers of the 76 and 90 mm gun tubes. On the 120 mm size, the larger bore and the 12:1 ratio of bar length to the diameter made bars of this type inadequate.

In producing the 120 mm size, a contour bore 40 in. long is required. Machining time with the reamer consumed more than 9 hours (floor to floor) and required tool maintenance of nearly $21 per chamber. The decision was made to try a carbide boring bar.

**• Powder Chambers**—They're made of alloy steel of 375 to 400 Brinell hardness and a 150,000 to 180,000 psi yield strength. The chambers are rough and semifinished to plus 0.002 in. through the entire length to assure a true dimension for finish grinding.

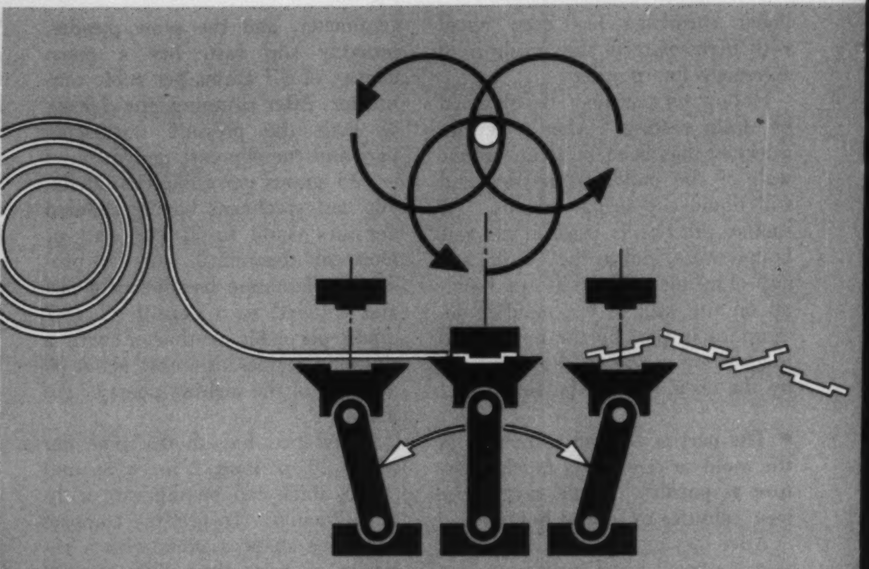
Boring bar specifications required a bar 64.500 in. long with about a 3½ in. diameter on the small end and a 5 in. diameter on the large end which mounts in the machine turret. Overhang is 43½ in. Maximum permissible deflection under the cutting load was specified as 0.004 in.

The Kennametal boring bar was highly successful in the first tests. No vibration or deflection took place during a roughing cut of 0.2 in. depth with 0.020 in. feed at 150 sfpm. Use of throw-away insert tooling in the bar and the elimination of vibration enabled a change to harder, longer life, carbide grade cutting edges. Precision ground square inserts with a 15 degree lead angle are used.

With the carbide bar, depth of cut was doubled from 0.125 to 0.250 in. despite a 64 per cent increase in bar length. Carbide bar deflection was only 0.002 in. compared with 0.010 in. for the bar with carbide reinforcing strips. Another advantage was an increase in average sfpm from 165 to 220 and a feed increase from 0.018 to 0.020 in.

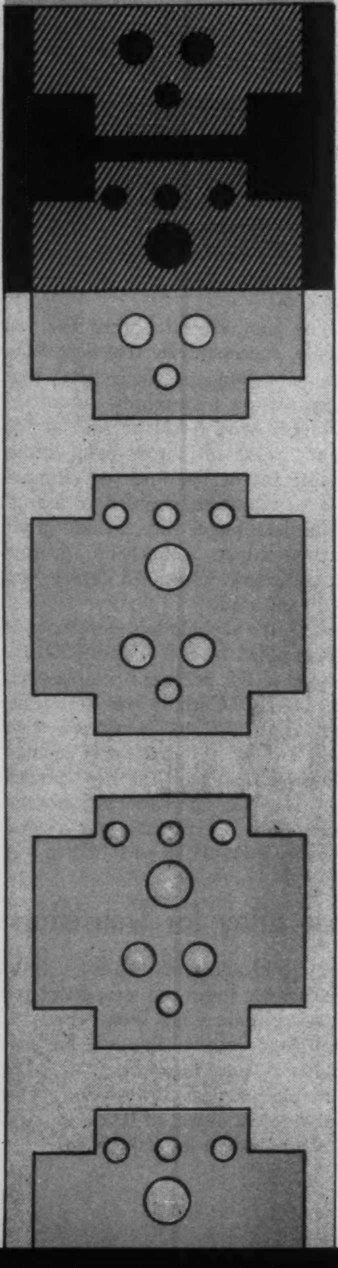
## New Alloy for Transistors

A gold-antimony alloy (No. 1549) with improved properties for transistor makers has been developed by Baker Contact Div., Engelhard Industries Inc., Newark, N. J. It's available in rods or whisker wire in diameters down to 0.001 in. and in sheets down to 0.0015 in.



Flying press converts coils to semifinished or completed parts; the fabricator benefits from the sheet-coil price differential

Sheet metal is pierced, notched, sheared, and formed in one operation, making semifinished parts



# Flying Press in Warehouse Helps Small Companies

MANUFACTURERS intent on cutting sheet metal fabrication costs are getting an assist from the flying press, says Wean Equipment Corp., Cleveland.

The machine is often too expensive or specialized for the small fabricator. But Rae E. Hasselbring, general manager, Warehouse Div., Reynolds Aluminum Supply Co., Atlanta, says it can be kept busy in the metal service center, converting coils to stampings in one operation for customers.

- **The machine offers savings to fabricators, but the warehouse will also benefit.**

Sheet metal users won't have to maintain large inventories. And raw material storage areas will be available for production, or for finished goods. Unused equipment can be sold, providing additional production space.

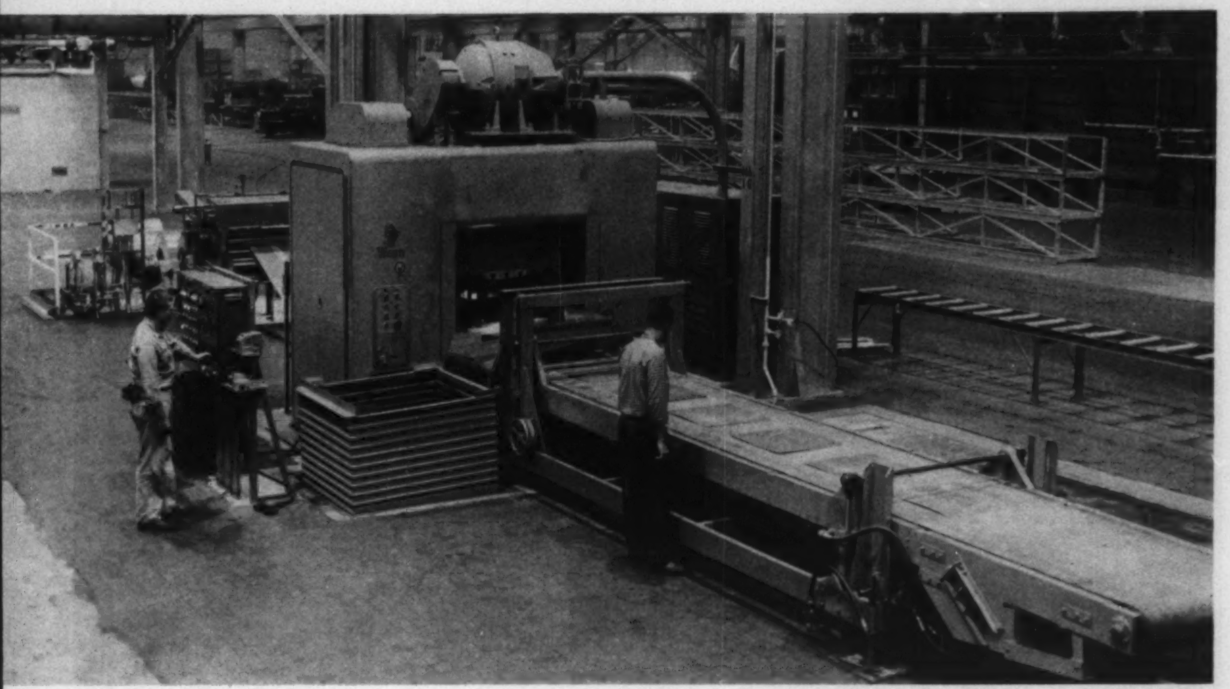
The service center will deliver usable parts, cutting the fabricator's inspection costs and eliminating scrap handling costs.

Warehouses will also be able to work with smaller inventories. They will maintain small stocks, in coil form, filling orders for sheets as they are required by customers.

- **Perennial warehouse problem: Stocking sheets in enough sizes to minimize scrap in the fabricator's plant. One solution: Coil processing.**

Mills have been asked to produce ever wider material, and warehouses have had requests for wider sheets. Example: Until recently, aluminum service centers stocked sheets up to 48 in. wide. Now many carry widths up to 60 in.

But blanking from standard size sheets didn't remain popular. Customers objected to excessive scrap and the difference between coil and sheet prices. Many service centers installed slitters to supply custom widths. That made less scrap and permitted use of coiled stock. Slit



**Circles, sign blanks, and other flat items are made at the warehouse with a flying press; scrap is eliminated from the goods delivered to the customer**

coils could be fed into forming machines continuously, to make small items.

Makers of larger products, such as vending machines, washing machines, and industrial lockers, needed bigger blanks. Several warehouses purchased machinery to cut coils in 6 in. to 14 ft lengths.

- **The need for faster work and the variety of jobs justified more refined equipment.**

At first, most warehouses used hump tables to cut material into standard lengths. The hump stores metal during shearing. But the method is said to be slow and inaccurate.

The measuring feed roll, another intermittent shearing device, measures sheet lengths with electronic impulses. The method is accurate for light gage material, but it is slow, says Mr. Hasselbring.

He recommends the flying press for cutting coils to length because of its high speed, accuracy, and continuous operation.

Leveling equipment in warehouses has also become more sophisticated. Commercial flatness (often good enough) is obtained by passing material through a backup leveler with small diameter work rolls.

Sheets can be leveled to panel flatness with a gripper jaw, stretcher leveler, or with a roller leveler that has extremely small work rolls.

- **Flexibility of the flying press permits it to be used for stamping, as well as shearing.**

A knife holder die is used in the press for normal shearing, or dies can be installed for continuous blanking and stamping. That permits coils to be converted directly into finished or semifinished parts. Circles, sign blanks, or other flat items can be made with the press; the machine can also do notching, punching, and shallow drawing.

One manufacturer uses his press to process coils in 33 in. widths. Piercing, notching, and shearing are done in one operation; blanks are then ready for final bending to make shelves. The press boosted production from 260 pieces an hour to 2500, and permitted a saving of 15 cents per piece in labor costs.

- **Prefinished, partially fabricated material helps small shops turn out top quality products with a minimum of capital investment.**

Some years ago, Mr. Hasselbring's company saw the need for better materials and finishes for aluminum awnings. Some small shops had difficulty finding a finish that could take weathering.

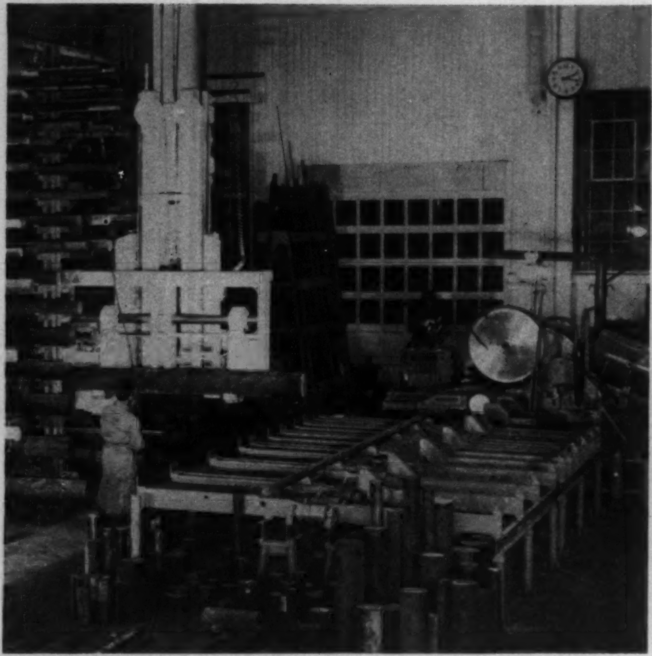
The problem was solved by using coils coated continuously with an enamel able to stand normal weathering for 15 to 20 years. The material was roller leveled, cut to length, and given a stepdown design on a toggle press.

- **Warehouses aren't interested in making end products. They'll supply standard length materials or blanks and show customers how to use them.**

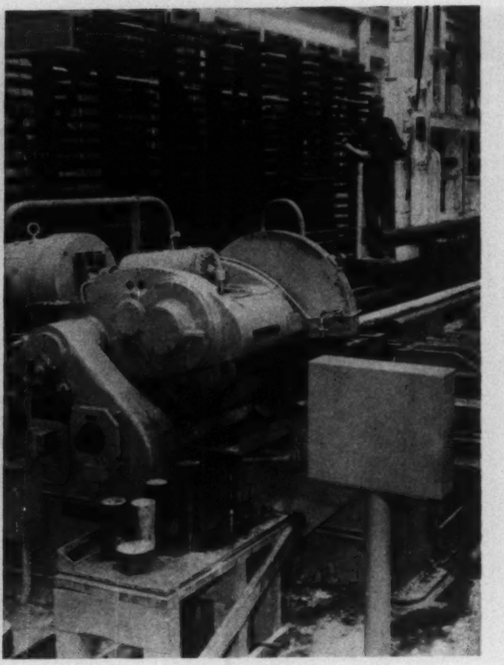
Growing demand for standard lengths prompted Reynolds Aluminum Supply to hiring industrial designers, who are developing new product programs. They will design items that use partially fabricated stock.

The company expects such projects to provide up to 350 additional customers, using as much as 6 million lb of aluminum a year.

Sales effort is aimed at hundreds of potential customers who need the same material, instead of a few large users with specialized requirements.



**Easing a heavy piece of bar stock out of the storage racks, the saw operator gets set to load the automatic machine**



**Preset machine cycle takes over as the saw cuts slugs from a bar. Operator, meanwhile, rides the crane to return a bar to storage**

# Equipment Crops Bar Stock Cutoff Costs

**Saw has an automatic cycle. Operator can preset the lengths to be cut and can instruct the machine to cut a specified number of slugs. Five lengths can be set in same cycle**

HEAVY bar stock is being custom cut with only half the number of men formerly required for the job at Ingersoll Milling Machine Co., Rockford, Ill.

The equipment that made the direct labor saving possible includes: A special automatic cutoff saw (designed and built at the Ingersoll plant), bar storage racks, an automatic saw sharpener, and a new stacker type crane.

**• Saw Is Programed** — Ingersoll officials say the saw is four times as productive as the equipment it replaced. Handling standard round and flat rolled shapes and forgings, the saw cuts off pieces up to 30 in. in length from bars up to 20 ft long. Maximum error: ±0.010 in. in the length of the cut piece.

It can be preset for any length within its range. Also, any five different lengths can be included in the same preset program, and the number of pieces (up to 72) of each length can be predetermined.

After the operator starts the automatic cycle, he is free to return leftover bar lengths to the storage racks, to center cut pieces as they come from the saw and mark them with part numbers, and to set up the automatic saw sharpener. As time permits, he also is available for operating a small cold saw on which smaller work is handled.

**• Handling's Easier**—Before starting the machine, the operator selects sufficient stock for several hours of cutting from the storage racks.

Riding on, or walking beside, the stacker crane, he loads the bars on the storage table beside the machine. From there, the bars are moved forward into clamping position, one at a time, by a pushbutton controlled power conveyor, which later returns them to another storage table for unloading.

When there is a sizable volume of repetitive work for the saw, the operator can do all the loading and unloading for a full day's run in 1½ hours. He thus has most of the day available for his other jobs, since the saw also requires only occasional attention.

In a six day check period, the work through the machine averaged 5 in. in diameter. The average number of cuts per bar was five, and the average cutting time per cut was less than 3 minutes.

***Experience**—the added alloy in* **Allegheny Stainless**

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900°
800°
700°
600°

# Easy-to-form metals with high strength up to 1000 F

**AM 350 and AM 355, precipitation hardening stainless steels by Allegheny Ludlum have many advantages for designers of missiles and supersonic aircraft in solving space age problems.**

**Among their many desirable properties, AM 350 and AM 355 combine high hardness and strength and stability up to 1000 F and yet possess good ductility. They are easy to form in the annealed condition.**

**They can be spun, drawn, formed, machined and brazed or welded using normal stainless steel procedures.**

**Both steels have excellent corrosion resistance and good resistance to stress corrosion and oxidation at higher strength levels.**

**AM 350 is available commercially in sheet, strip, foil, small bars and wire. AM 355, best suited for heavier sections, is available commercially in forgings, forging billets, plates, bars, wire, sheet and strip.**

**For further information, see your A-L sales engineer or write for the new technical booklet, "AM 350 and AM 355." Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.**

003

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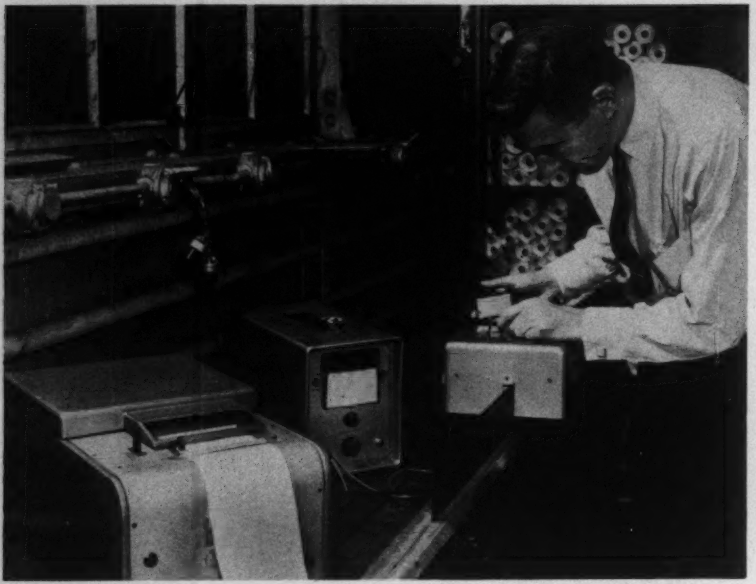

Pickup head moves along the edge of a sample strip cut from a hot band at the coiler; the profilometer makes a recording of transverse crown and surface

# Profile Check at Hot Mill Insures Quality Strip

**Rejected material is minimized by an instrument that finds ridges as they start to show. Test takes less than 3 minutes; mill corrections are made immediately**

A RECORDING profilometer helps insure high edge-to-edge surface quality on strip coming from a 96 in. hot mill at Great Lakes Steel Corp., Detroit, a division of National Steel Corp.

The equipment, supplied by Micrometrical Mfg. Co., Ann Arbor, Mich., permits faster mill corrections to eliminate surface flaws. It should lead to a 60 to 70 per cent reduction in rejects caused by ridges, says D. H. Dellinger, quality control vice president at Great Lakes Steel.

**• Roll wear, improper adjustments, and defective spray equipment must be detected soon to minimize mill rejects.**

The company constantly checks the gage of hot rolled steel with x-ray gages. But the longitudinal path of the gage on the strip doesn't permit edge-to-edge examination without stopping the mill.

Previously, the transverse surface of the strip was checked with hand micrometers. But that took too much time and didn't produce a continuous profile. Strip comes off the mill at 1200 ft a minute; failure to spot ridges and make mill repairs or adjustments promptly could lead to production of 500 to 1000 tons of defective material.

When the steel is cold rolled, ridges cause more serious defects, and the material is rejected by inspectors. Needed: A quick, accurate way to check strip surface and see ridges as they begin to appear.

**• Electromechanical gaging equipment detects ridges in minutes.**

The company asked Micrometrical for help on the gaging problem. Suggested: A conventional profilometer recorder, with a pickup that would drive itself along the edge of sample strips cut from the hot bands as they come from the mill.

The instrument produces a continuous, transverse profile of the strip in 60 to 90 seconds.

**• Spotchecks are made every half hour, or during scheduled shutdowns for roll changes.**

The mill can't be stopped to check surface quality of every coil. Examination of samples taken at intervals and prompt remedial measures keep strip up to standard.

Each sample—a 4 in., edge-to-edge segment of the strip—is cut from the hot band and chilled in water. It is taken immediately to a quality control laboratory near the hot mill and checked with the profilometer to see if crown and surface meet specifications.

A variation of 0.003 in. on strip 0.90 in. thick is out of tolerance, and the roll operator is told that ridges are forming on the steel. He is then given time to check rolls and sprays and to correct abnormal conditions.

Coils that are run off before defective rolls or sprays are spotted are identified so they can be given special attention in subsequent operations.

If defects aren't serious, careful cold rolling can keep them up to quality requirements. Steel with severe ridges isn't cold rolled; it must be set aside and sold as lower grade material.

## Lance Hoist Is Developed

A hoist for oxygen jet lances, adaptable to remote mounting and automatic control, has been developed for the steel industry by Reading Crane & Hoist Corp., Reading, Pa. It has been field tested in more than 20 steel plants.

The unit can be mounted on floor, wall, or ceiling, to meet furnace requirements. The standard model, driven by a 3 hp motor, has a 2000 lb capacity. Fluid drive is optional. Speeds, controls, limit switches, and brakes are tailored to user specifications.

## *"We've practically eliminated off-grade heats with MANTEMP ferromanganese"*

An almost foolproof way to hit open-hearth manganese specifications consistently is with ladle additions of MANTEMP ferromanganese. Mill superintendents have reported that the alloy yields high recoveries and allows substantial reductions in overall ingot costs.

Fine grain size specifications can also be met easily because MANTEMP ferromanganese does not preferentially oxidize separately added aluminum. The alloy is available in both high- and medium-carbon grades, packed in cans containing exactly 40 pounds of manganese.

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

**For further information, write for this new six-page MANTEMP ferromanganese bulletin.**

**UNION CARBIDE METALS**

***Electromet** Brand Ferroalloys and other Metallurgical Products*

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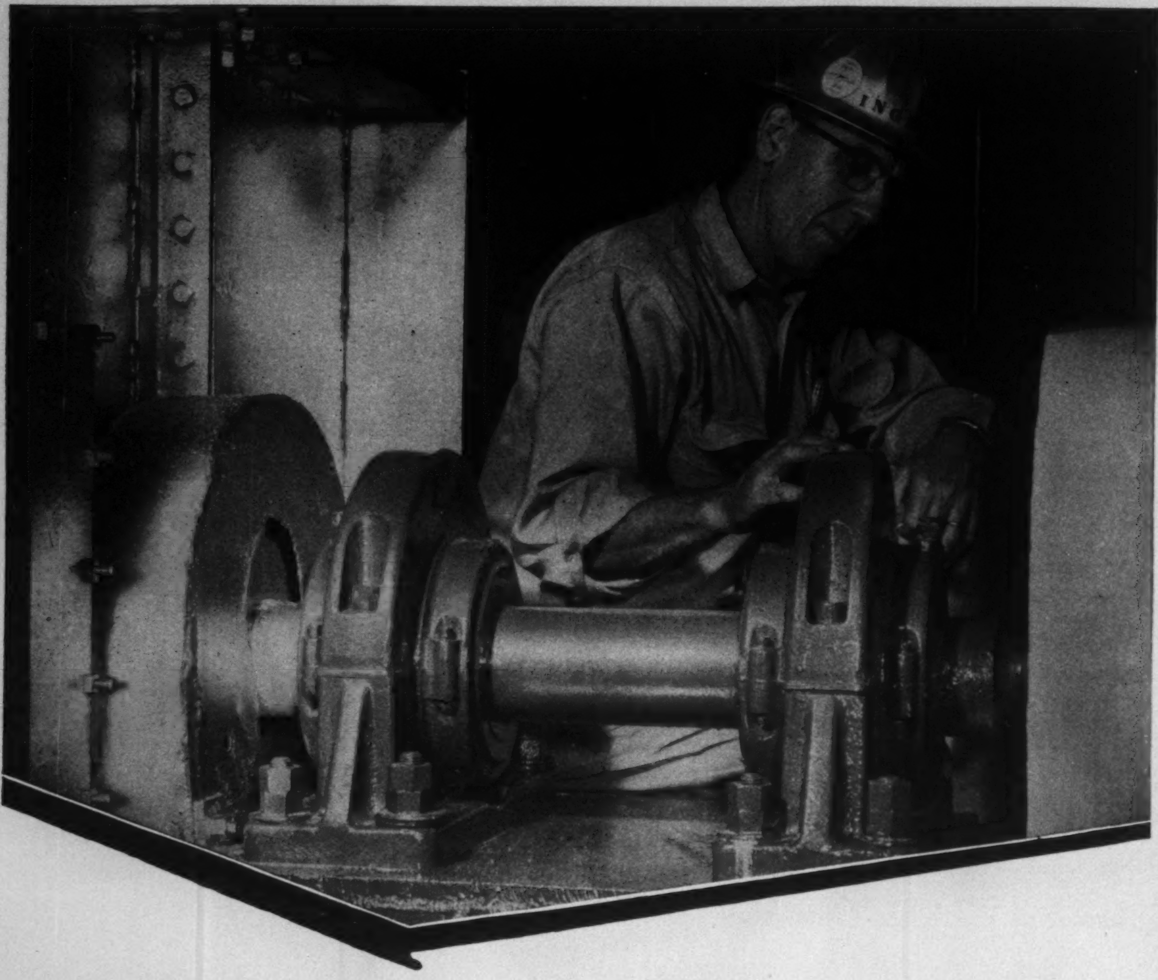

## Former bearings took a day . . .
## this bearing replaced in 1 hour and a half!

Here is one of several 4-7/16″ shaft size split roller bearing pillow blocks installed on large, high speed fans at the Kaiser Aluminum & Chemical plant in Baton Rouge, Louisiana. Split roller bearings were purchased by Kaiser after thorough study and on the recommendation of our sales engineers! Our recommendation was based on the ability of these bearings to stand up under constant use and because it is split right-down-to-the-shaft, removal is both simple and fast.

Shown above is Maintenance General Foreman, Ivy Ingram, with the bearing his crew replaced in only one hour and a half. It formerly took many more hours to pull the sheave or coupling, pull the bearing, dress the shaft and install a new bearing. With this new split bearing, they simply removed six cap bolts and went to work.

We are authorized distributors for all the bearings we sell. They come to you in the manufacturers' boxes guaranteed by the maker and our company. Ask for our recommendation on all bearing requirements–There's a branch near you giving fast service 24 hours a day!

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## Search Is On to Find Use for Depleted Uranium

Four research centers of the Bureau of Mines are co-operating with the Atomic Energy Commission to find uses for the mounting stockpile of depleted uranium, reports the Department of Commerce.

Several thousand tons of the material (uranium hexafluoride) are available each year as a result of separating the isotopes U-238 and U-235. The material is not fissionable, but is slightly radioactive; uses developed must be licensed by the AEC.

- **Investigations are being carried on to evaluate its use in metallurgy:**

1. As an alloy for lead, tin, or copper to produce a superior combination for metal bearing.
2. As a sacrificial anode to control corrosion of underground pipes, ship hulls, or similar objects.
3. As a slurry in the recovery of high value minerals. Uranium is more dense than ferrosilicon and magnetite commonly employed as a slurry to separate different minerals.
4. As an alloy to impart high tensile strength to steel.

- **Applications may be found in the petroleum industry.**

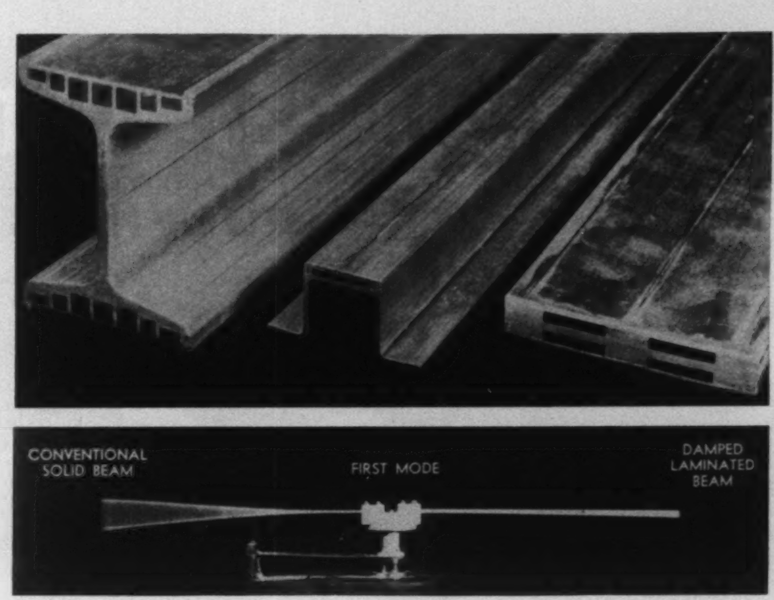
Uranium in the form of uranium oxide is being tested as a catalyst in laboratory scale refining of shale oil. The tests are promising but more studies are necessary.

## Brazing Time for Stainless Honeycomb Cut to Minutes

A new, high speed process for brazing stainless steel honeycomb developed by Rohr Aircraft Corp., Chula Vista, Calif., reduces brazing time from hours to minutes.

The process is based upon a brazing chamber containing a graphite cloth heating element devised by National Carbon Co., a division of Union Carbide Corp.

B. R. Alsobrook, Rohr's manager of stainless products, reports that honeycomb is turned out in ½ hour (average) compared with 23 hours in conventional furnaces. In tests, the chamber has heated panels to 1680° F in as little as 3 minutes.



**Vibration tester compares damped beam with solid type (17 cps). Three typical members include standard 3 in. aluminum beam which has 14 steel inserts**

# Material Fights Vibration

### Laminated construction provides damping ability. Designed for electronic, missile, and aircraft applications, principle can be applied to solve problems elsewhere

SHOCK AND VIBRATION problems can be alleviated by a new technique which builds damping qualities right into structural materials.

The claim: Resonance vibration in structures made the new way is amplified only five to ten times compared with 60 to 300 times in common materials, and it's done without vibration isolators.

"Initial uses are in electronic, missile, and aircraft industries," states Ervin Pietz, Barry Controls Inc., Watertown, Mass., "but there is no reason why the principle won't work as well on ordinary structures if the vibration problem is severe enough to warrant it."

- **The damping materials can be formed or fabricated like ordinary metals or plastics. Best results depend on structural design.**

Structural forms used by Barry include conventional shapes, such as channels and I-beams. They get their high damping ability from a laminated or cellular construction. Sheets and thin rectangles of metal or plastic are laminated with a rubberlike material; heavy sections are made with cells running lengthwise which contain the elastic material. In flexing, the sliding or movement of the laminations is impeded by the rubberlike material which absorbs most of the energy.

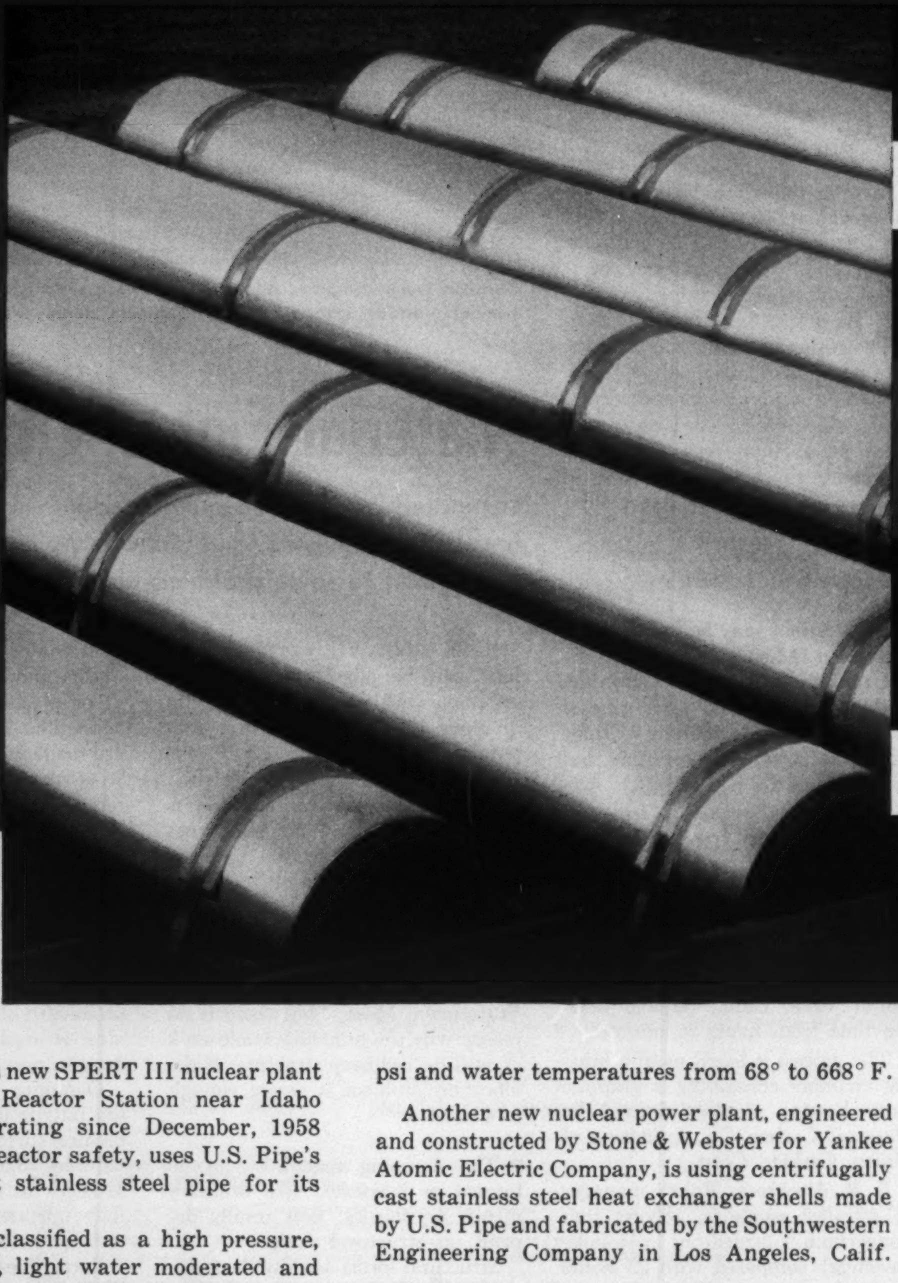
The same principle can be applied to structures already in use. A damping piece or "fix" can be attached to the side of a part to produce a similar effect. The same idea is useful in developing new designs, says Barry.

Damping is expected to extend the fatigue life of treated structures because surrounding stress levels are reduced. Such structures are not sensitive to vibration changes, and they operate across a wide range of frequencies.

Barry doesn't plan to market the structural members, but it will offer design and fabrication services for specific applications.

# new nuclear plants choose

## FULFILLS THE EXACTING
## HEAT EXCHANGERS



Centrifugal stainless steel castings readied for shipment by U.S. Pipe

The Government's new SPERT III nuclear plant at the National Reactor Station near Idaho Falls, Idaho, operating since December, 1958 to study nuclear reactor safety, uses U.S. Pipe's centrifugally cast stainless steel pipe for its coolant system.

SPERT III is classified as a high pressure, high temperature, light water moderated and cooled reactor. Its versatility permits transient tests under various initial conditions of pressure, temperature, and coolant flow. For example, pressures ranging from atmospheric to 2,500 psi and water temperatures from 68° to 668° F.

Another new nuclear power plant, engineered and constructed by Stone & Webster for Yankee Atomic Electric Company, is using centrifugally cast stainless steel heat exchanger shells made by U.S. Pipe and fabricated by the Southwestern Engineering Company in Los Angeles, Calif.

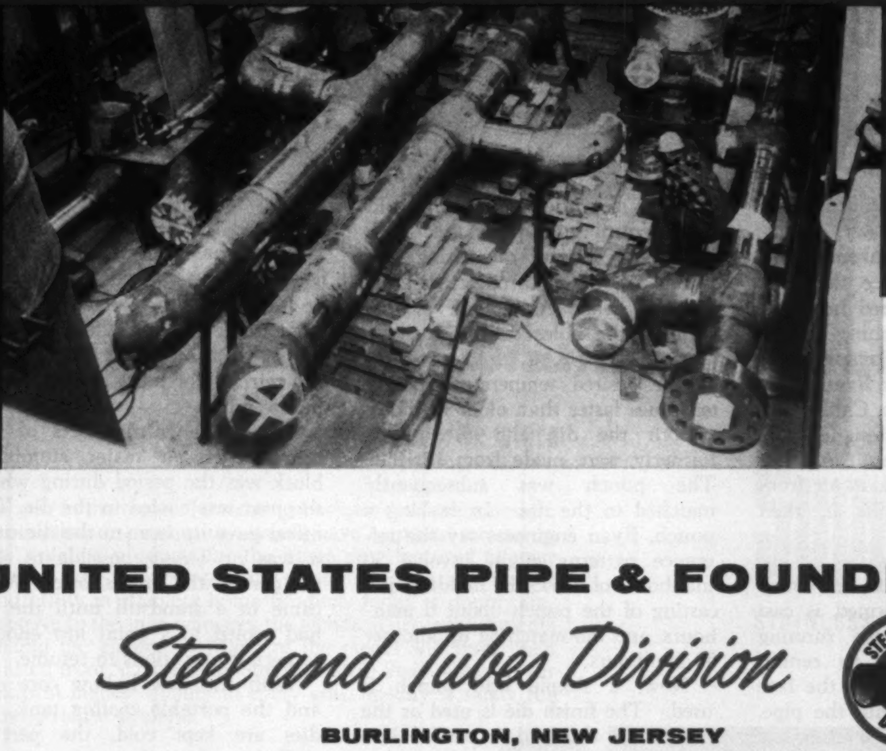
Stainless steel, centrifugally cast, made to rigid specifications, may be the answer to your piping or heat exchanger problem. For more information, write or call:

# centrifugally cast stainless

## REQUIREMENTS OF NUCLEAR
## ND COOLANT SYSTEMS

Shop-fabricated heat exchanger shells of centrifugally cast stainless steel ready for shipment to the Yankee Atomic Electric plant at Rowe, Mass.

Subassemblies of primary coolant piping of centrifugally cast stainless steel being installed in SPERT III.



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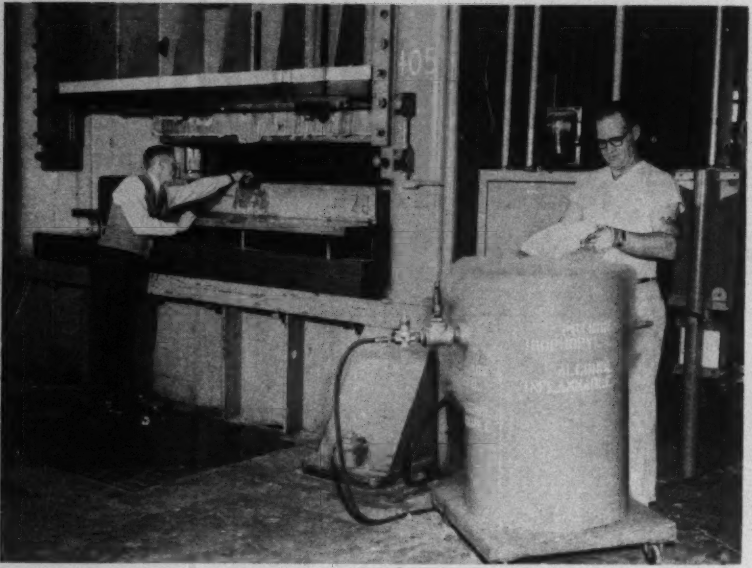


Cold air, fed through the chilling tank (at right), enters the die to quick-cool hot parts and to keep die temperature low. John F. Reeser, Ryan engineer who developed the process, is checking the holes in the die through which the air flows

# Quick Die Quench Shatters Forming Bottleneck

DIE QUENCHING that used to take 10 minutes now takes less than 1 minute.

Equally important, the quench dies can be run continuously. Formerly, they had to be taken out of action periodically, since they absorbed heat from the red hot metal until they lost quenching ability.

Two quench innovations were developed by engineers at Ryan Aeronautical Co., San Diego, Calif. First, there's the specially designed die, with a cooling system built in. Second, a portable tank takes air from the plant supply, chills it, then sends it into the die.

• **Die Design**—The die on which the metal is finish formed is cast with a 3 in. iron pipe running longitudinally through its center. Drilled holes run through the face and sides of the die into the pipe. The pipe is threaded on each end so tubing can be attached. The tubing connects to a portable cooling tank that supplies cold, dry air at subzero temperatures, at a pressure of 60 psi.

Before the die is put into operation, it and the punch are cold soaked until both parts are 40° F or lower. During quenching, the frigid air blast through the die keeps it cold. As the air escapes through the holes drilled into the face of the die, it chills the part to the desired temperature nearly ten times faster than older methods.

Both the die and the punch formerly were made from Kirksite. The punch was subsequently matched to the die. In making a punch, Ryan engineers say the reference patterns might involve 30 manhours of work, the molding and casting of the punch about 6 manhours, and the matching up another 60 manhours.

Now, a simple lead punch is used. The finish die is used as the mold, and the lead is poured into the die. That assures complete and accurate matching, and since the die doesn't heat during the quenching process, the lead punch doesn't melt during use.

• **How the Tank Works**—For the subzero air supply, a barrel, about 3 ft high and 26 in. in diameter, is mounted on casters. Inside the barrel is an airtight tank 14 in. in diameter and 22 in. high. A 3 in. diameter air intake pipe runs through the side of the barrel, into the tank and within 2 in. of the tank bottom. This pipe is equipped with a connecting tee for air intake from the plant pressurized air supply, a pressure regulator, and a safety valve. On the side opposite the intake pipe, and at the top of the tank, is the air discharge pipe—connected to pipe embedded in the die.

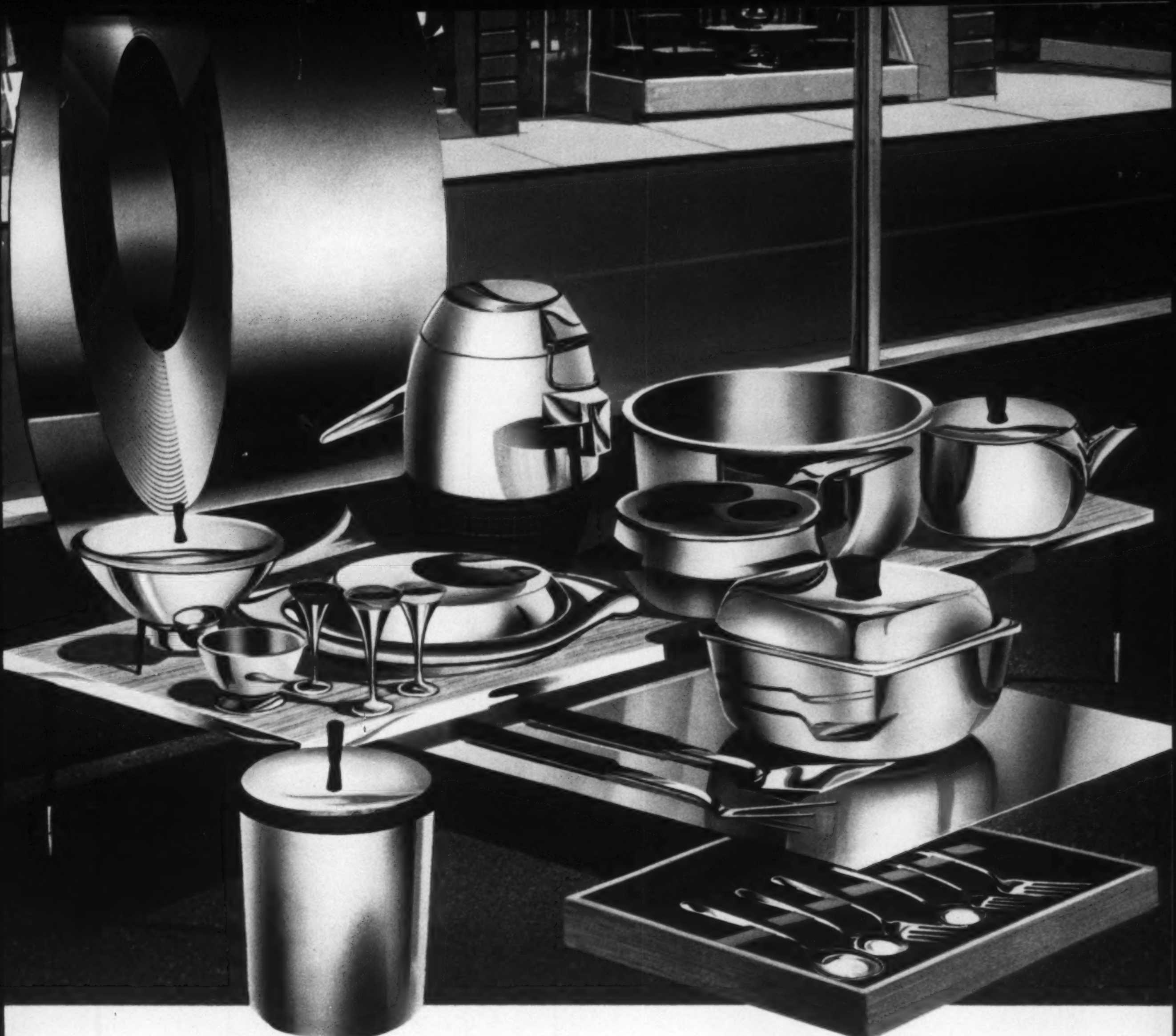
The inner tank is filled with dry ice. The space between the tank and barrel is filled with isopropyl alcohol and dry ice. Air is forced through the dry ice to the bottom of the tank. Then it rises through the dry ice and goes into the die.

• **Typical Cycle**—The cooling cycle is required in many of the alloys used in high speed jet aircraft. One alloy, Armco's 17-7 PH stainless steel, can serve as an example. Ryan uses tons of that alloy in the pods and pylons for the Douglas DC-8 Jetliner.

Parts are first formed from the annealed material. Next, they are heat treated to provide proper hardness. A critical part of the heat treat cycle is the time during which the metal is brought from an oven (where it has been held at 700° F), cooled in the quench die to 80° F or lower, and then placed in a refrigerator. Moving the part from the oven, through the die, and into the refrigerator must be done within 15 minutes.

Before the introduction of the new process, a major stumbling block was the period during which the part was cooled in the die. The metal gave up heat to the die until it was no longer possible to chill the part in the time allowed. Work came to a standstill until the die had cooled to a point low enough to permit operations to resume.

With the new hollow core dies and the portable cooling tank, the dies are kept cold, the part is chilled in about 1 minute, and the press remains in production as long as required.



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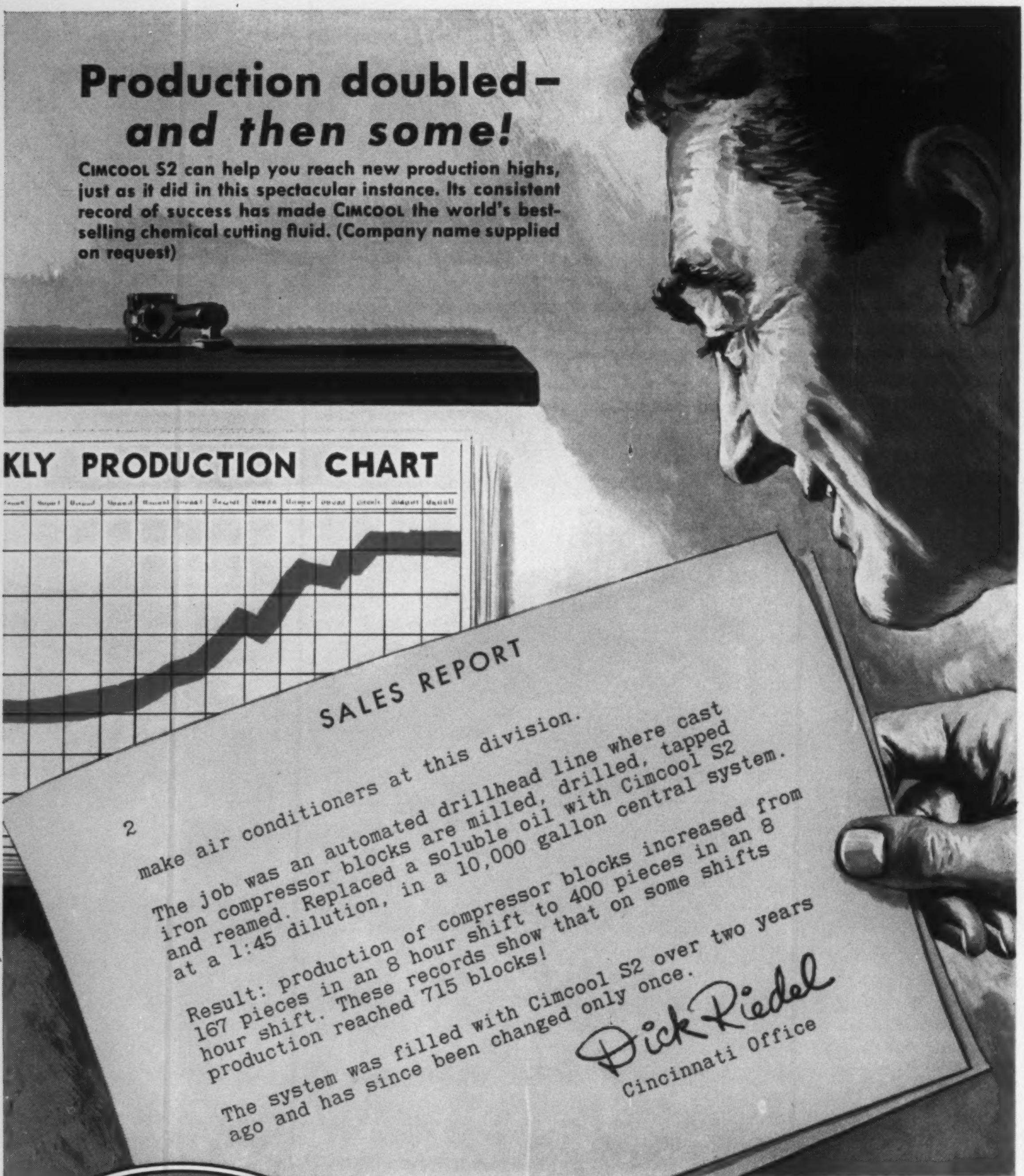

SALES REPORT

2

make air conditioners at this division.

The job was an automated drillhead line where cast iron compressor blocks are milled, drilled, tapped and reamed. Replaced a soluble oil with Cimcool S2 at a 1:45 dilution, in a 10,000 gallon central system.

Result: production of compressor blocks increased from 167 pieces in an 8 hour shift to 400 pieces in an 8 hour shift. These records show that on some shifts production reached 715 blocks!

The system was filled with Cimcool S2 over two years ago and has since been changed only once.

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Cincinnati Office

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°Trade Mark Reg. U. S. Pat. Off.

## Hot Top Makers Seek to Cut Ingot Pouring Costs

A research project to improve hot top material for ingot molds is underway at Alfred University, Alfred, N. Y.

The Clay Hot Top Institute approved a $2700 grant for the project which will be directed by Dr. Wayne E. Brownell, professor of research.

The institute members are all manufacturers of hot tops. They are seeking an improved ceramic material that will enable steelmakers to reduce the amount of molten metal that has to be poured to fill ingot molds.

The use of exothermic agents to keep metal fluid long enough to produce a full ingot has reduced the amount of metal used for hot tops. But the practice requires better materials.

Aim of the research project: To make a clay hot top no bulkier and of about the same weight as those in use but with better insulating properties to help cut costs in pouring ingots.

**OVERHEAD DRILL PRESS** solved the problem of drilling 150 to 200 holes in ebony asbestos and steel switchboard panels too large for the throat capacity of a conventional drill press. Electric Box & Switchboard Co., Chicago, uses the Delta tool to drill panels up to 40 by 72 in. with drills, hole cutters, and fly cutters

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**Operator prepares to rotate magnesium shell after initial expansion to size. Object is to eliminate flat spots between die shoes**

# Heated Mandrel Expands, Hot Forms Magnesium Alloy

**The technique and its tooling handle new alloy without distorting or overaging parts. Aircraft firm employs electrically heated dies and a portable preheating furnace**

ONE OF THE NEWEST high temperature, magnesium-thorium alloys for missiles (HM21A-T8) is best formed while hot.

Marquardt Corp., Van Nuys, Calif., developed a way to do the job quickly and efficiently. Product: A truncated cone for a missile.

● **The method employs a 300 ton hydraulic mandrel with electrically heated dies which expand the part into final shape.**

A combination of cold work and artificial aging puts HM21A into the T8 condition. Look at its tensile properties vs. temperature and you'll find reasonable strength and stiffness up to 700° F—over 800° F for short periods.

The property that makes the material valuable for missiles is a handicap to forming. It stands little elongation and has poor ductility at room temperature. Marquardt used a heated mandrel and a preheating furnace to get around the problem. Small scale tooling experiments established that Calrod heating units were best for the die.

The face plate for the dies was machined from an Armco 17-4 PH stainless casting grooved for the heating elements. (The plate bears against the material being formed.) A ½ in. sheet of Transite insulates the face from the mild steel backing plate, which is also cooled by air blown between it and the expanding shoes of the press.

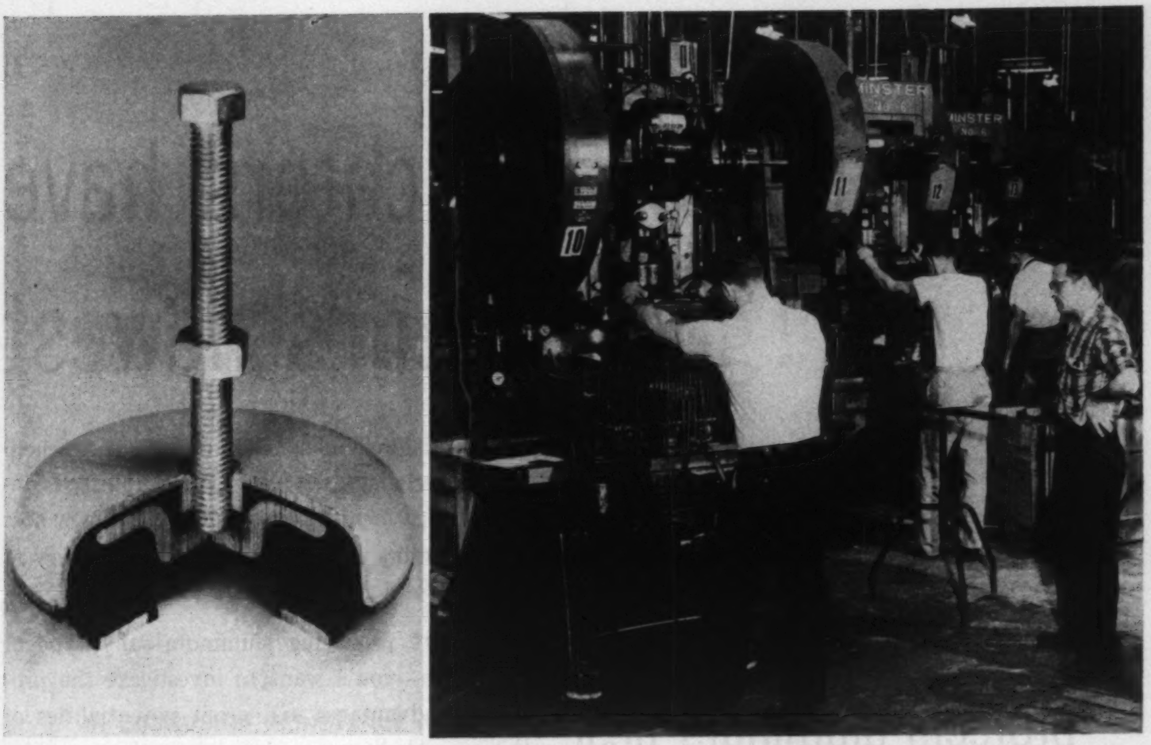
Rolled cones are fusion buttwelded and the flash ground flush inside. Preheated cones are put on the mandrel. Die segments expand slowly until in perfect contact. After a brief soaking period, the mandrel is expanded to final size. The cycle is repeated several times while the part is rotated to remove flat spots between segments. Excess material compensates for expansion shortening. A lathe trim completes the operation.

● **Uniform temperatures are needed for three reasons: 1. To keep metal at its best forming condition. 2. To control finished dimensions. 3. To permit better stress distribution and improve plastic deformation.**

Failure to hold temperature lets the part form irregularly—stress rising in hot spots causes ruptures, and nonuniform springback causes distortion. Overheating also causes overaging and a loss of material properties.

The heating units are connected to a 440 volt source. Temperature is controlled by a direct-reading potentiometer mounted on the control console (its thermocouple is in one of the face plates). A contact pyrometer is also used to check each die segment to insure even temperatures.

Allowance for tooling expansion was built into the dies, so they form the part 0.200 in. and 0.300 in. larger on the ends to compensate for shrinking.


Machinery mounts have eliminated lagging and bolting, and have reduced installation time. Plant arrangement is flexible; lift trucks can be used to move presses

# Mounts Mobilize Presses, Lower Maintenance Costs

**Reflector Hardware Corp. realized substantial savings by using leveling mounts when it moved into a new building. Added benefits: Machine mobility and noise reduction**

BECAUSE a plant superintendent and his maintenance engineer didn't want to drill holes in a new concrete floor, they equipped their machinery with leveling mounts. The idea brought them an initial $2000 saving, and it's still paying off.

The men, Superintendent Joseph Trutty and Engineer John Ernstberger, work at Reflector Hardware Corp., Chicago. The saving was in the cost of moving equipment from their old, two story building and installing it in a new, one floor factory with a 6 in., reinforced concrete floor.

Today, the machines (which include 50 punch presses with capacities of 20 to 75 tons) can be moved, rearranged, or removed as a matter of routine. The leveling mounts supplied by Barry Controls Inc. (Watertown, Mass.) eliminated all lagging and bolting.

**• The advantages of machine mobility showed up a few months after the move.**

The company added an 18-ft-long channel to its line of products. When production orders hit the shop, it became necessary to replan the machine layout. As the channels moved through the presses in continuous operations, they interfered with the operation of adjacent presses.

The solution was to move every second or third large press in the original line and replace it with a light press. The large presses were then set in the old light press locations.

If the presses had been bolted to the floor, each would have been down two days. Because of the leveling mounts, the saving was 8 man-hours per move, and the presses were back in operation within a few hours. About a dozen moves have been made since, and the saving continues at the same rate.

**• Protection of the new floor was the first reason for installing the mounts.**

After two years of operation, the pressroom floor is still in perfect condition.

Another important consideration was the plant move. The machinery mover estimates the nominal cost of bolting, lagging, and leveling each light and medium press at $50 to $75. With leveling mounts on *in only 90 days...*

# 101 aluminum fabricators have ...Amchem's newest

## ALODINE 1200S

## protects aluminum best ...at less cost, in less time!

To the hundreds of long-time users of Amchem Alodine—the first, low cost effective surface conversion treatment for aluminum—add a new host of fabricators who are employing the newest Alodine development—ALODINE 1200S!

If you are producing aluminum—any type of aluminum—you'll want to investigate the production advantages and profit potentialities of this new Alodine pre-paint process that provides constant, uniform quality as well as big savings in time, equipment and processing costs!

Through increased chemical activity ALODINE 1200S slashes processing time *up to 50 percent!* A 1200S system can be installed on your production line quickly and conveniently . . . and bath is maintained chemically . . . no special equipment required to control contamination! In an ALODINE 1200S system, products can be processed through continuous dip in the same time cycle other conversion coatings require for continuous spray lines! That means lower initial equipment and maintenance costs, wider range of product applications regardless of the application method—brush, dip, continuous strip or spray. ALODINE 1200S is qualified under Government Specification MIL-C-5541.

ALODINE 1200S is Amchem's positive answer to constant uniform quality in aluminum processing. Put its assured protection and production flexibility to work for your aluminum products and market them with greater confidence!

# switched to Alodine 1200S conversion coating!

**FASTER, LOW COST, EFFECTIVE AND FLEXIBLE, ALODINE 1200S IS PROVIDING NEW HIGHS**

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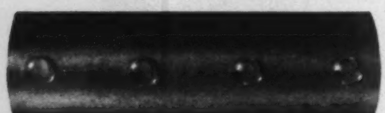
**Allenpoint's deep, full-circle bite assures tremendous resistance to removal torque! Stays tighter longer!**

When you need a set screw that you can depend on to stay tight under heavy strain and vibrations, specify ALLENPOINT. Here's why you can always depend on ALLENPOINT: proper design of the cup diameter results in a rugged grip that makes the full-circle pattern you see here . . . deep, strong, clean sockets allow full wrenching leverage . . . and uniform Class 3A threads assure a tight friction lock over the entire length of Allenpoint Set Screws.



Ask your ALLEN Distributor for samples and full engineering details—he's always ready, willing, and able to give you prompt, practical service!

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**ALLEN MANUFACTURING COMPANY**
**HARTFORD 1, CONNECTICUT, U.S.A.**

the machines, he can pass along a saving of 60 per cent. Additional savings in handling, transportation, and drilling brought the over-all reduction to 75 per cent.

Machine mobility was part of the original plan. Properly designed mounts keep the presses from walking and allow them to be moved easily. A standard fork lift can handle a 30 ton, open back inclinable press, and machinery rollers can easily move units four times the weight of a 30 ton, OBI press. The user can plan layout, flow, and storage areas to fit needs.

- **Another benefit: Noise reduction.** When presses are bolted directly to the floor, the entire building can become a sounding board. Placing the machines on mounts isolates radiated sound, and it can no longer be magnified.

Airborne noises (a die hitting the material or sound from air ejection systems) cannot be lessened by mounts. Noise reduction depends on the ratio of airborne and radiated sounds. George McKewen, sales manager, Industrial Div., Barry Controls, estimates that a reduction of 10 to 30 per cent can be expected. In a building such as Reflector Hardware's (cinderblock construction) and with similar equipment, an average reduction of 18 to 20 per cent can reasonably be expected, he explains.

Another fringe benefit of the mounts has been reduction of press maintenance, says John Ernstberger. The checking and tightening of lag bolts has been eliminated. Die clamps and tierods do not loosen.

From management's point of view, the investment in machine mounts at Reflector Hardware has been profitable. Sam Froehlich, president, believes the machine mobility he gains permits his company to produce parts at lower cost and keep ahead of competition.

## Additive Aids Galvanizing

A fluxing additive called Wes-X 501 acts as an adhesive to keep the flux close to the base metal in galvanizing and hot dip tinning. It eliminates the critical time between fluxing and hot dipping. It can be used in any aqueous flux bath, says Westinghouse Electric Corp., Pittsburgh.

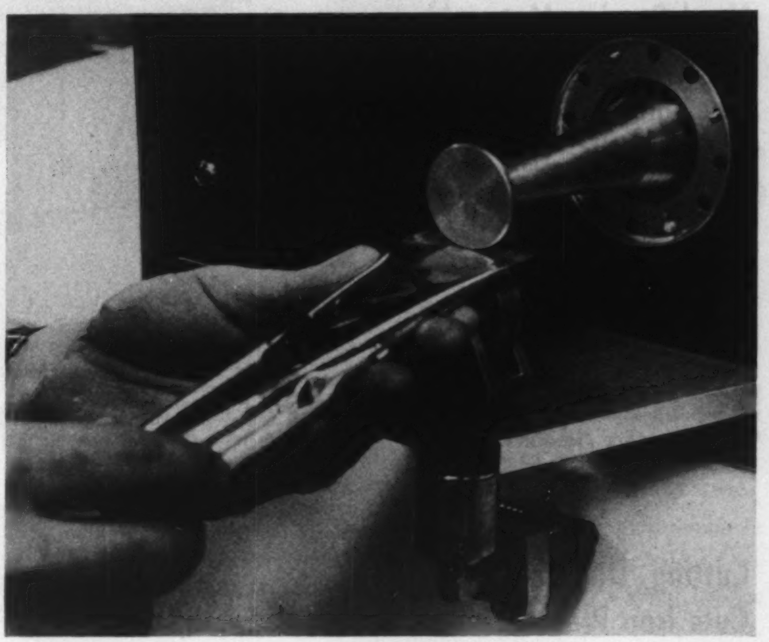
# Ultrasonic Foil Welder Joins Aluminum, Copper

WITH THIS rotary tip, ultrasonic, foil welder, you can weld such metals as aluminum foil and copper. Materials as thin as 0.00025 in. and up to 0.006 in. can be effectively and quickly joined by high frequency sound alone.

The company says the Glennite Rotary Welder is suited for continuous welds on flat or semicircular sheets. It's advantageous to users who must avoid heat during the welding process. Ceramic transducers are used.

The equipment automatically maintains correct welding angle, speed, and pressure. Human error is practically eliminated. Production models measure 23⅜ in. high, 21¾ in. wide, and 15¼ in. deep. The welding horn and generator are integrated into a single housing.

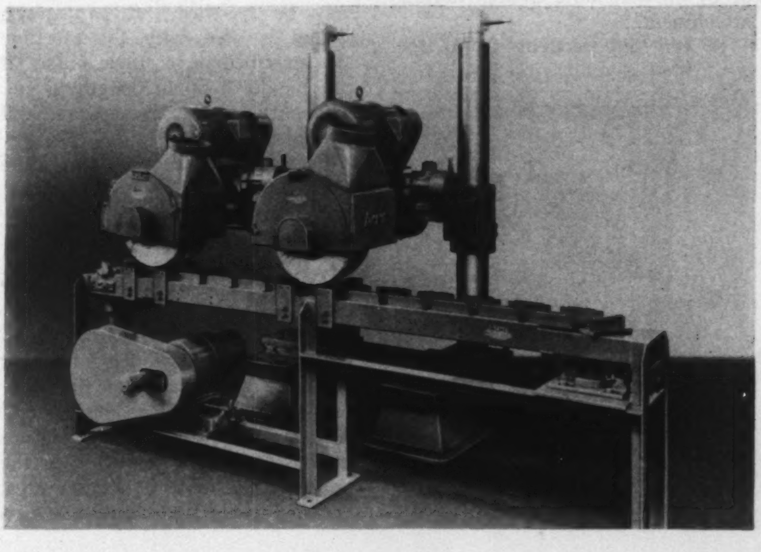
For further information, *write* Gulton Industries Inc., 212 Durham Ave., Metuchen, N. J.



# Buffing, Polishing Unit Does Production Work

HERE is a straight line buffing and polishing machine that's suitable for light duty, production operations. Adjustable lathes may be positioned around the unit for tangent or wide wheel, cross cut buffing. Acme polishing heads and abrasive belt arm attachments can be applied for strapping and contact wheel polishing type operations for deburring and blending purposes.

The machine has a 10 in. wide, 8 ft long conveyor unit and lathes that perform the buffing operations. Additional conveyor sections can be added when finishing requires more lathes. The conveyor has a chain drive and individual platens for carrying workholding fixtures. A ¾ hp motor powers the conveyor through a variable speed drive



(from 10 to 30 ft per minute). Part loading and unloading are done at one end of the conveyor.

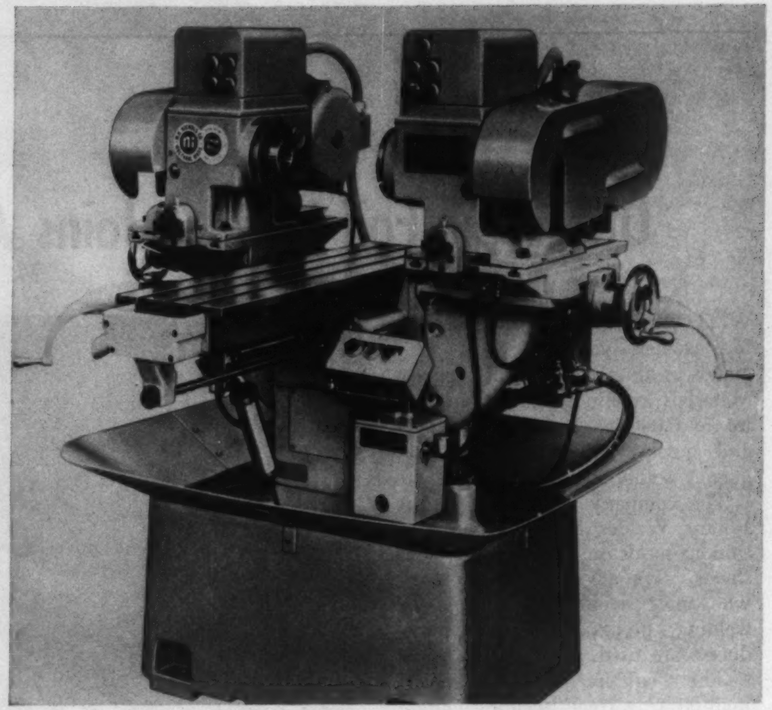
For further information, *write* Acme Mfg. Co., 1400 E. Nine Mile Rd., Detroit 20, Mich.

## Need Bearing Material For Subzero Applications?

A BEARING material (Sinitex) for cryogenic use is self-lubricating, inorganic, and has a low coefficient of friction. Operational temperature capabilities range from −300 to 500° F. Composition of the bearing is bronze, molysulfide, and Teflon.

The material is available in bar stock 6 in. long with outside diameters of 0.300, ½, ¾, and 1 in. Sizes up to 6 in. OD can be made to specifications.

For further information, *write* Booker-Cooper Inc., 6940 Farmdale Ave., North Hollywood, Calif.



**DUPLEX MILLER PERMITS HEAVIER CUTS** over the 20 in. table feed range. The unit has 2 hp motors for both milling heads. A failsafe electrical system automatically returns the power feeds to their starting positions if a power failure occurs. Both milling heads have six way micrometer screw adjustments. The cutter retracts automatically on the table return stroke. The unit has a provision for double table cycling to allow rough and finish cuts at one setting. For further information, **write** REM Sales Inc., Box 41, West Hartford, Conn.

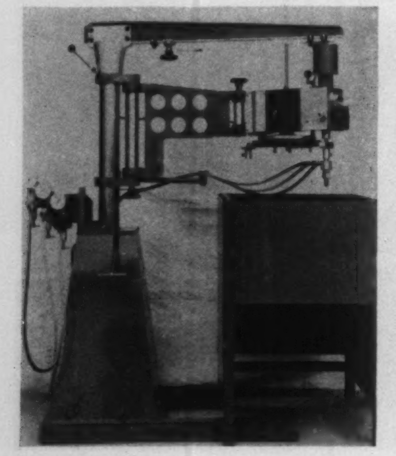
## Cutting, Duplicating Unit Cuts Iron Plates to 4 in.

INDIVIDUAL or batch cuts of profile sections can be handled with the Milo automatic oxygen cutting and duplicating machine. Cuts can be made from iron or steel templates, to a line drawn on the plate itself, or by an automatic circular cutting attachment.

It can cut sections from iron plates ⅛ to 4 in. thick. Surfaces are clean and smooth. Controls are convenient. Cutting gas and oxygen follow separate passages to the torch head.

Acetylene, hydrogen, propane, illuminating gas, or any other gas may be specified. A pantograph system is used with the machine arm mounted on a single pillar. It can handle a 60 in. length of cut. The cutting table is separate and portable.

For further information, *write* Milo Mfg. Co., 259 N. Broad St., Elizabeth, N. J.



## Mobile Loading Ramp Has Open Grating Surface

BUILDUP of snow, ice, mud, oil, or grease is eliminated on the Magline series of mobile loading ramps. A heavy duty, all grating surface extends from curb to curb over the entire length of the traction area. Serrated tracks are set into the grating surface for wheel traction, and are available in different tread widths. They can be handled by one man.

The ramps are available in 58 and 70 in. widths and in 30 and 36 ft lengths. Capacities range from 7000 to 20,000 lb. Units with greater capacities can be obtained.

For further information, *write* Magline Inc., 1900 Mercer St., Pinconning, Mich.

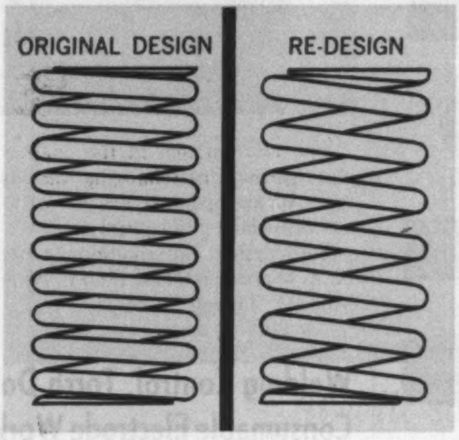
## Retractable Air Coupling Cuts Load, Unload Cycles

A RETRACTABLE air coupling with a self-contained air cylinder for power chucks and throughfeed spindles has been developed by N. A. Woodworth Co.

The device can be used with automatically cycled or manually controlled bar feed machines. It's applicable only for devices operated on horizontal spindles. The unit facilitates machining shaftlike parts

# 70 POUNDS OF SPRINGS

# were just going along for the ride!



10 coils—.120″ wire
130 lbs. of wire per
1M springs

7 coils—.105″ wire
60 lbs. of wire per
1M springs

Because of mounting cost conditions, a user of motor-support springs asked for a complete design check. Redesigned by A.S.C. engineers, required stresses were met by a slight change in wire size, allowing a reduction in number of coils from 10 to 7. This meant a saving of 70 pounds of material per thousand springs. Because of the shorter length of wire, coiling and grinding speeds were increased, heat-treating time reduced. Saving to the customer—40%.

How about the springs you use? A consultation on your specifications costs you nothing. Just contact any Division of Associated Spring Corporation. For a handy reference to spring action, write for "Spring Design and Selection—in brief."

5994

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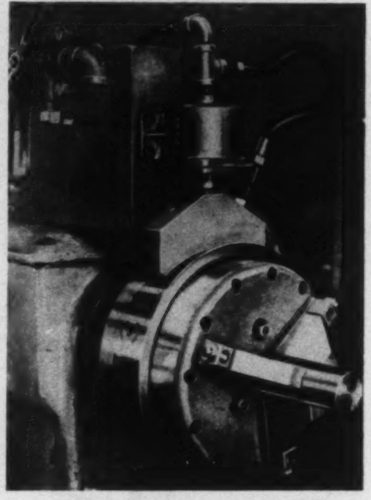
that project into the spindle and can reduce cycle time for load and unload stages.

Operation: An air actuated shoe contacts the periphery of the chuck adapter plate when the air valve is turned on. When the chuck stops, the shoe will be over one of a series of special valves in the adapter plate. After the part is in chucking position, the air is turned off and the shoe retracts.



The valve system in the adapter plate permits interchanging various types of air operated devices without disturbing the control setup.

For further information, *write* N. A. Woodworth Co., 1300 E. Nine Mile Rd., Detroit 20, Mich.

## Welding Control, Torch Do Consumable Electrode Work

THE Dual Shield arcwelding control is a portable 55 lb unit that can pass through an opening 18 in. in diameter. The Dual Shield arcwelding torch was designed for the unit, but it can be used with other controls.

Both units are designed for consumable electrode welding processes using shielding gases (such as argon, helium, or carbon dioxide) in making horizontal fillets and flat position welds.

A control motor with a governor is used for the wire drive. The control has a wire feed rate from 55

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it switches, spots and hauls!
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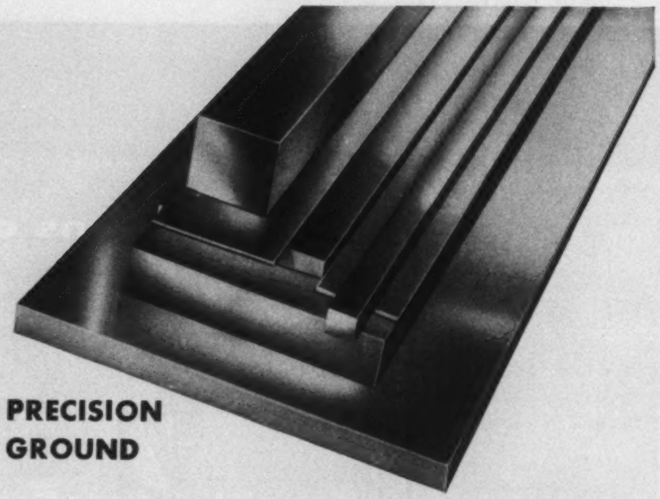

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During February
A spray can of
DoALL Layout Fluid
with every tool steel
order amounting to
$25.00
or more.

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Need tool steel? This is a good time to place your order to take advantage of this Economy Special.

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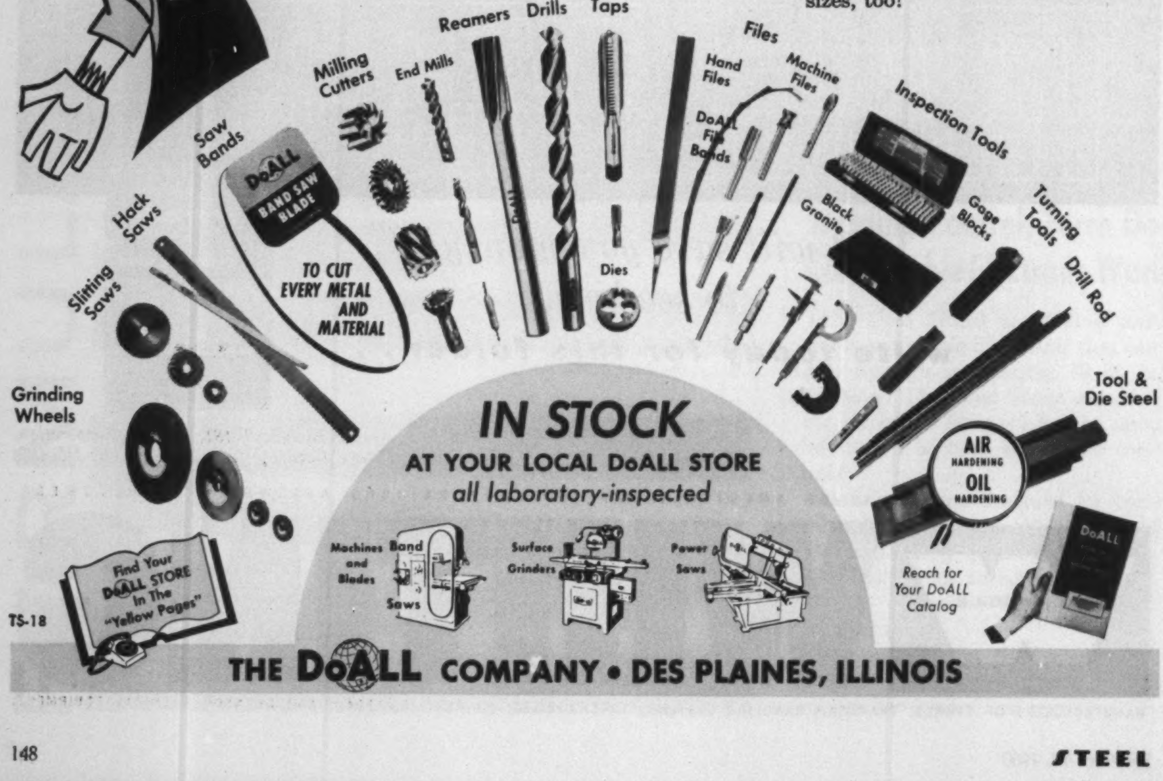
Your local DoALL store carries a large stock of tool and die steel SAE O1 oil-hardening and SAE A2 air-hardening—more than 1500 sizes ready for immediate delivery. Also large stocks of low carbon steel for parts that do not have to be heat-treated or simply require case-hardening. All items are laboratory-inspected, protected with a special rust-preventive coating, individually packaged.

***DANNY DoALL SAYS***—"Compare the finish! Compare the analysis! I'm mighty proud of DoALL's Tool and Die Steel. It's precision-checked for a 25-micro-inch RMS finish or better. Try it!"

Make up your want list today and call your DoALL store. And remember, DoALL gives you fast service on hundreds of special sizes, too!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to 500 in. per minute for 3/64 to 3/32 in. wire. The double gate wire drive unit provides positive drive, and tends to straighten wire as it passes through.

For further information, *write* National Cylinder Gas Div., Chemetron Corp., 840 N. Michigan Ave., Chicago 11, Ill.

## Airless Spray Gun, System Need Less Fluid Pressure

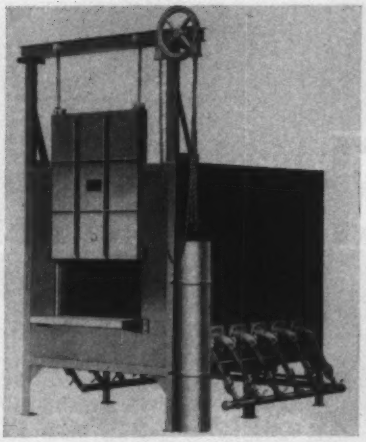
DEVELOPMENT of a unit called an H-Gun and improvements in the HydraAirless 20 have eliminated flooding and pigtailing in airless spraying. The company also says material can be handled with a 40 to 100 per cent increase in efficiency.

Fluid pressure needed for atomization has been reduced by 40 to 50 per cent. Edges of the spray pattern can be properly feathered to permit overlap without danger of runs or sags.

For further information, *write* Spee-Flo Co., 6614 Harrisburg Blvd., Houston 11, Tex.

## Heat Treating Furnaces Work Without Blowers

HIGHER HEAT ranges and larger work capacities are available in a 30 in. series of Buzzer gas fired, heat treating furnaces. One unit (Model No. 367236) has an inside work space 72 in. long, 36 in. wide, and 36 in. high. The unit has quick heatups to 2000° F with an hourly input of 1.5 million Btu. Construction includes a chain drive door, silicone carbide hearth, and a firebrick lining.

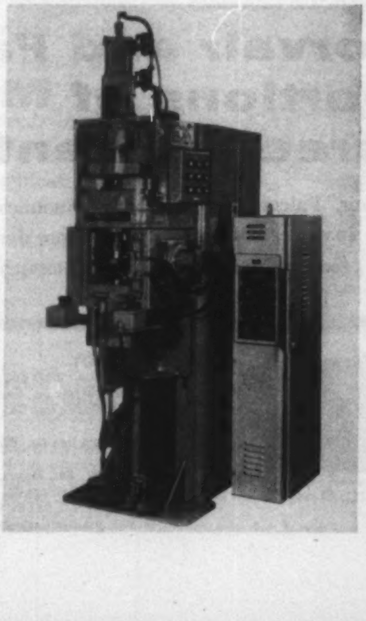


Six Buzzer atmospheric, venturi burners operate without blowers, power, or other auxiliaries. External pilots are used. Prepackaged automatic temperature controls are optional.

For further information, *write* Charles A. Hones Inc., 2473 Grand Ave., Baldwin, N. Y.

## Force Welding Unit Makes Full Area Percussion Welds

A 100 KVA magnetic force welding machine makes full area percussion welds. It can be adapted to many operations that require joining of nonferrous metals. The machine is tooled with a sound baffle cage and fume exhaust system for full area percussion welding of large silver-cadmium-oxide contacts to brass contact arms.

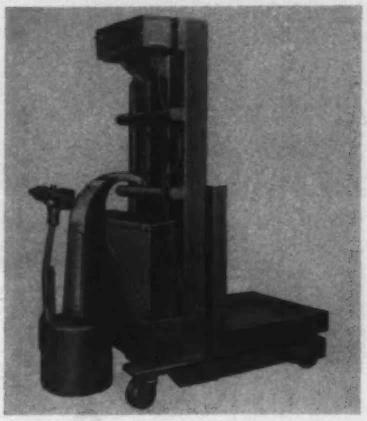


The electronic welding control is fully synchronous with selective half cycle and positive and negative heat control functions.

For further information, *write* Acro Welder Mfg. Co., 1719 W. St. Paul Ave., Milwaukee 3, Wis.

## Platform Type Lift Truck Can Handle Heavy Jobs

THE HIGH CAPACITY, 24 volt Jackstacker can solve many problems in limited maneuvering areas where heavy duty lift trucks can't be used. Capacities go up to 19,000 lb.



It can handle jobs such as moving heavy dies from storage to processing areas. The "walkie" design can be constructed to various capacity, speed, and space requirements.

For further information, *write* Dept. R10-1, Lewis-Shepard Products Inc., 125 Walnut St., Watertown 72, Mass.

## Silicone Fluid Is Multipurpose Type

AN ELECTRICAL grade silicone fluid with an extremely low temperature pour point is available from GE.

The material is identified as SF-85 (50) and is designed as a dielectric fluid. Among suggested uses: Special lubricant, heat transfer medium, mechanical fluid.

For further information, *write* Silicone Products Dept., General Electric Co., Waterford, N. Y.

# Big Three's Little Three

## to get Greater Strength for Maximum

Corvair
Falcon

Each time a trio of these new cars rolls off the assembly lines at Ford, Chrysler Corporation and Chevrolet, another set of 67 Malleable parts goes into action to give American drivers more dependability, convenience and economy.

## Valiant, Corvair and Falcon Use Greater Proportions of Malleable Iron Than the Three Conventional Cars!

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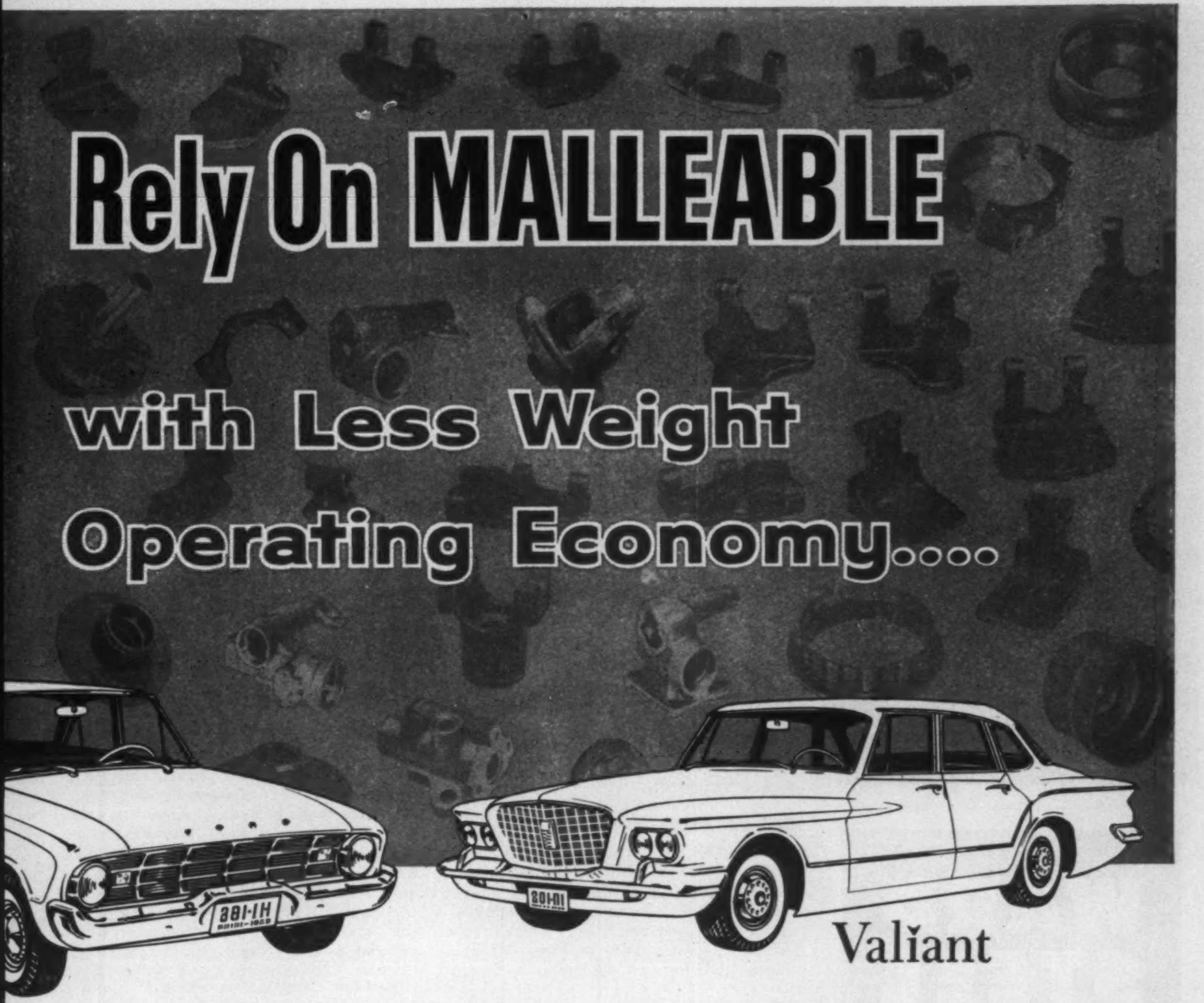

three newest creations use *more* Malleable in proportion to total materials than all other models of the same manufacturers. Why? Malleable provides *more strength per dollar* than any other metal, ferrous or non-ferrous. Malleable castings have *more strength per pound* than "light" metals. Being the *most machinable of all ferrous metals* of similar properties, Malleable speeds production . . . produces better parts. Malleable castings have proved uniquely dependable for critical applications in millions of cars now on the highways.

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Texas Foundries, Inc., Lufkin
**WEST VIRGINIA**
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# NEW Literature

**Write directly to the company for a copy**

### Vacuum Induction Melting

"Superalloys by Vacuum Induction Melting," 36 pages, describes the process that produces many of today's alloys for aircraft and missiles. Metals Div., Kelsey-Hayes Co., New Hartford, N. Y.

### Salt Bath Furnace

Bulletin 151 describes the advantages of the graphite "continuing" electrodes in salt bath furnaces. Salt Bath Furnace Div., Lindberg Engineering Co., 2443 W. Hubbard St., Chicago 12, Ill.

### Casting Properties

A 4 page bulletin provides a complete tabular summary of the engineering properties of the various types of Meehanite castings available in industry. Meehanite Metal Corp., 714 North Ave., New Rochelle, N. Y.

### Pump Data

Bulletin 1050-4, 8 pages, gives design features and model specifications of Chempump Series C sealless "canned" pumps for leakproof pumping of corrosive, toxic, explosive, radioactive, and other problem fluids. Chempump Div., Fostoria Corp., P. O. Box 35-27, Huntingdon Valley, Pa.

### Cobalt Alloy Data

"Magnetostriction in Cobalt and Cobalt Alloys," 60 pages, outlines the reciprocal and nonreciprocal mechanical and magnetic effects on ferromagnetic materials produced by magnetization. Cobalt Information Center, Battelle Memorial Institute, 505 King Ave., Columbus 1, Ohio.

### Aircraft Spec Chart

A folder type specifications chart, contains information on applications, physical properties, and chemical properties. Tube Distributors Co. Inc., 1389 Kellum Place, Garden City, N. Y.

### Thermoforming Techniques

Machinery function, material characteristics, and performance required of vacuum forming machines are outlined in a bulletin. Comet Industries, 9865 Franklin Ave., Franklin Park, Ill.

### Plastic Ventilation Products

Bulletin No. B-500 describes Heil corrosion resistant rigid vinyl and reinforced plastic ducts, fittings, hoods, stacks, covers, etc., and lists standard sizes, specifications, and chemical resistance data. Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland 11, Ohio.

### Plastic Data

A plastics table shows physical, electrical, chemical, and optical properties of nine thermoplastic materials. Cadillac Plastic & Chemical Co., 15111 Second, Detroit 3, Mich.

### Weld Fastener Catalog

A 50 page combination catalog and welding manual includes welding information, electrode data and designs, and setups for welding individual parts. Sales Dept., Ohio Nut & Bolt Co., 33 First Ave., Berea, Ohio.

### Process Controller Data

A 24 page application data book describes the use of transistorized, digital, preset counters; process controllers; and other sensing devices which are used to provide precise numerical readout and actuation of automatic control functions. Dynapar Corp., 7312 N. Ridgeway Ave., Skokie, Ill.

### Instrument Catalog

"Master Catalog No. 21" lists precision instrument components and associated tool and electronic components. PIC Design Corp., 477 Atlantic Ave., East Rockaway, N. Y.

## NEW BOOKS

*Steelmaking for Steelmakers,* A. Jackson, Publications Dept., United Steel Companies Ltd., 17 Westbourne Rd., Sheffield 10, England. 265 pages, $6.

Written for the men who make open hearth steel, this text offers fundamentals on refractories, furnace firing, and instrumentation. It emphasizes steelmaking chemistry and tells why close analysis and temperature control are important when a heat is tapped. Preparation of molds and ladles and pouring of ingots are discussed in detail. The book stresses the need for increased use of oxygen in the open hearth; it also compares feed ore and gaseous oxygen refining methods.

*Aluminum Construction Manual,* Aluminum Association, 420 Lexington Ave., New York 17, N. Y. 389 pages, $3.

Structural data on aluminum are presented in detail. The manual is intended as an aid to engineers and designers of aluminum structures. The authors discuss structural shapes, estimating and detailing information, allowable loads on 6061-T6 beams and columns, and standards and specifications.

*Flat Rolled Products: Rolling and Treatment,* Edited by T. E. Dancy and E. L. Robinson, Interscience Publishers Inc., 250 Fifth Ave., New York, N. Y. 128 pages, $3.75

Vol. 1 of a series based on technical conferences sponsored by the Metallurgical Society of AIME, this publication contains a detailed discussion of factors influencing profile of flat rolled products, the surface texture of these materials, and a series of reports on heat treatment. Heat treatment in open and closed coils is covered in one paper, and others present information on continuous annealing and normalizing, including a discussion of the liquid sodium process. Question and answer portions of the discussion are also reported.

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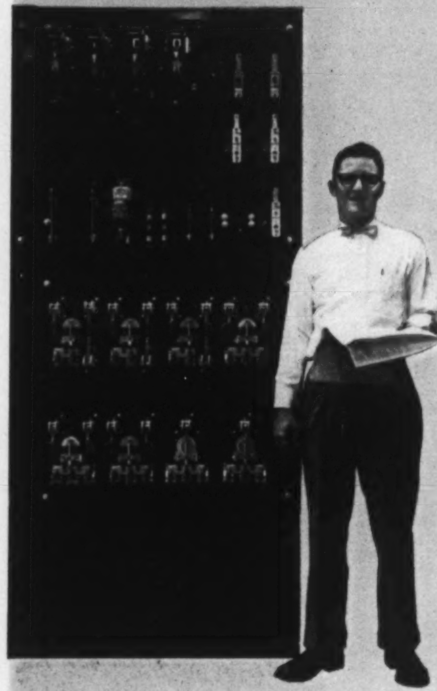

R. M. Bosshardt, Manager,
Heavy Duty Metal Rolling Section,
Reliance Electric & Engineering Co.

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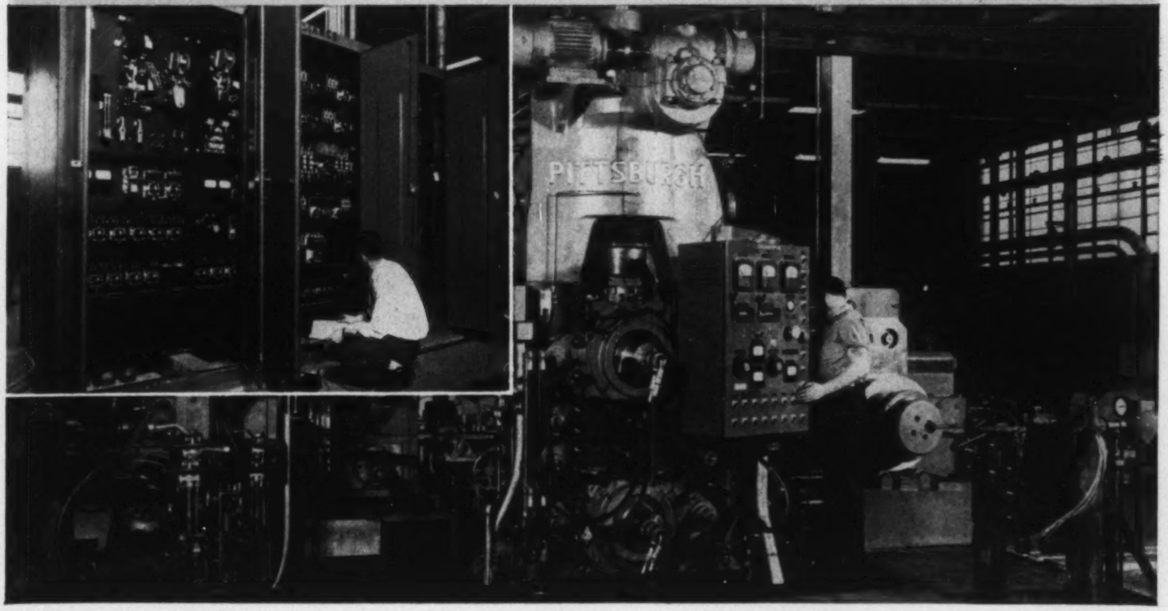

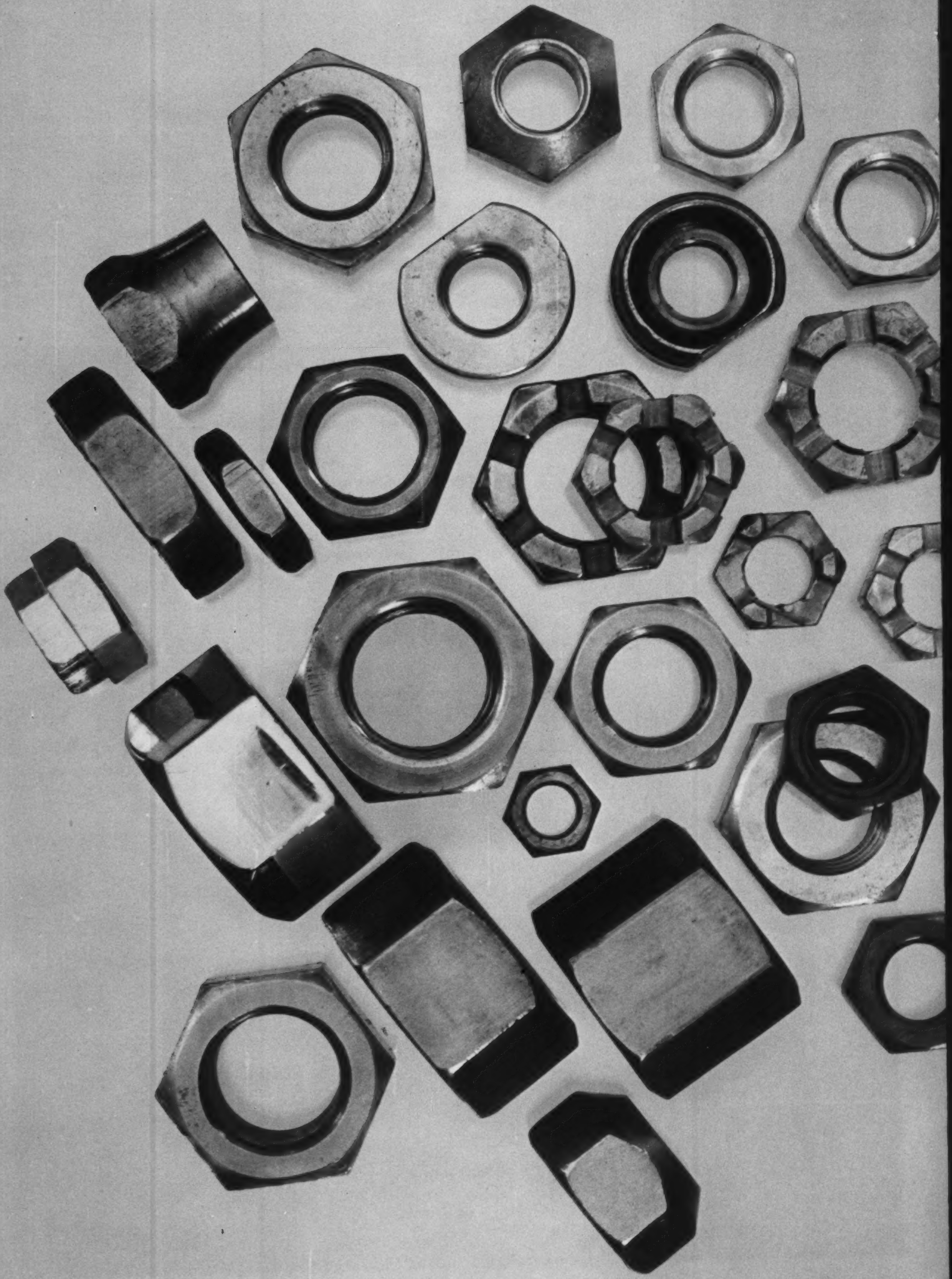

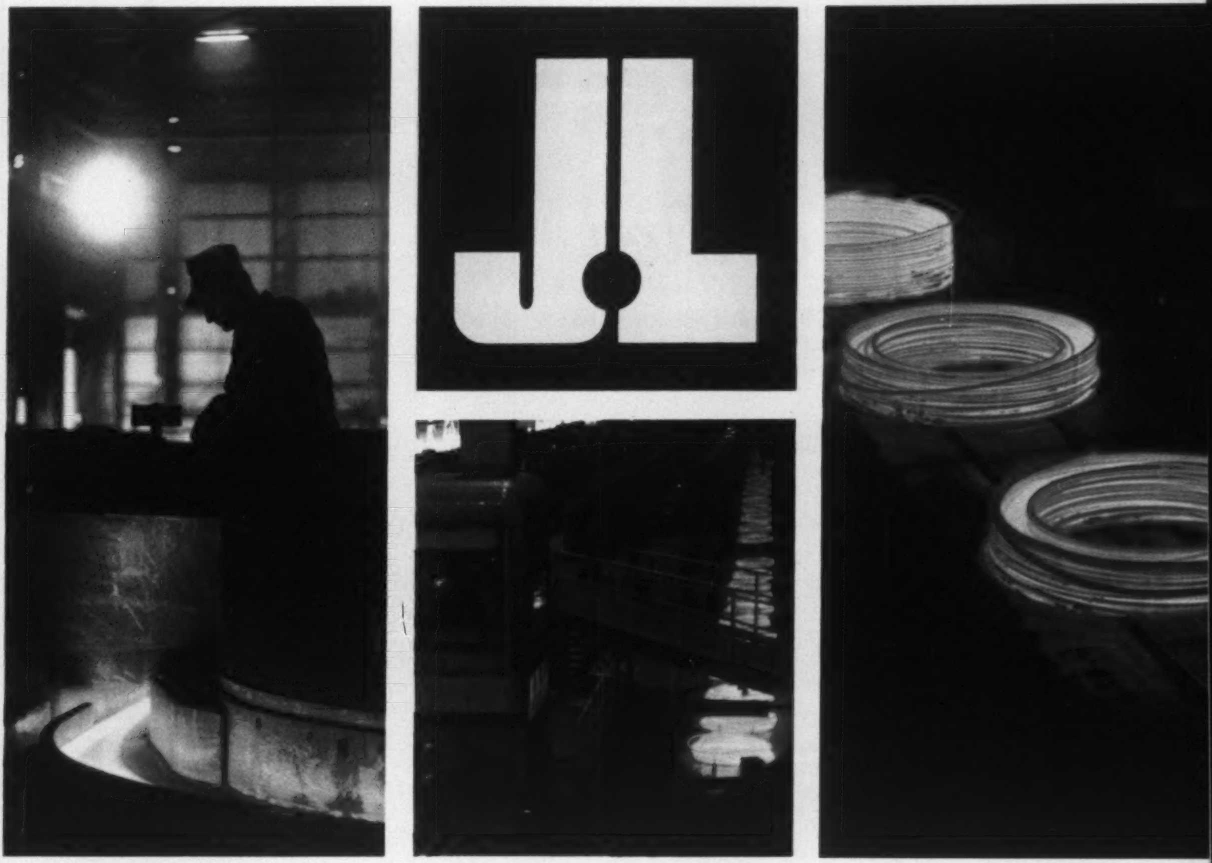

Pittsburgh Works bar mill—where scrapless nut quality hot rolled steel bars are tailor-made for any nut application.

We may not know your production equipment
We may not know your product application
We may not know anything about your specific requirements

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**and, we do know all about scrapless nut quality hot rolled steel bars** and the techniques in metallurgy and in nut-forming that result in smoother production runs, fewer rejects and less waste. We know how to achieve the precise balance and uniformity in steel bars to provide you with the best combination of nut-forming properties. We can assure optimum metal flow characteristics and shear strength so that the steel will cold work easily and will not crack. We control steel to low rates of strain hardening so that large volumes of metal can be upset without annealing. Most important, we regard your nut-forming problems as our major challenge. . . .

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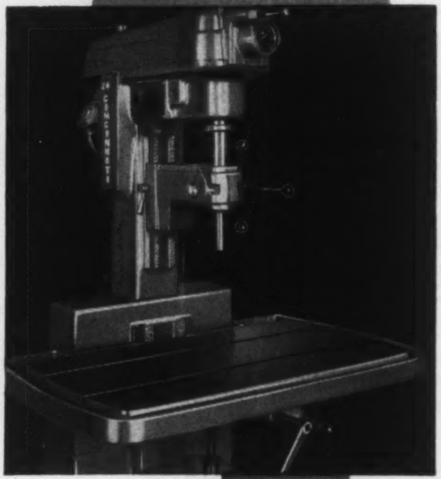
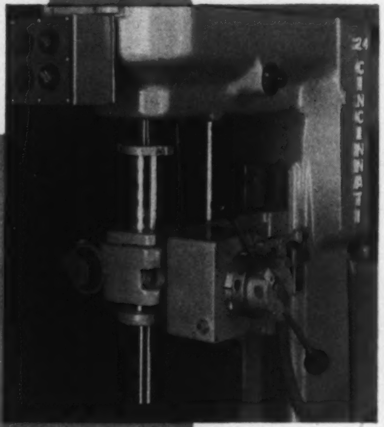
# *per drilled hole...*



Two vital factors in drilling costs are Machine Investment and Operator Time *. . . and CINCINNATI Customized Sliding Head Drills minimize both!*

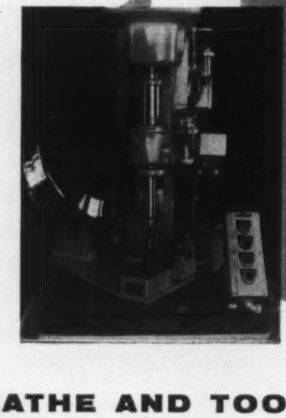
Your CINCINNATI is "tailored" to suit your type of work exactly. You buy only the cost-saving combination you need—minimum machine investment. You provide all the necessary time-saving equipment—the operator keeps the drill cutting more of the time.

And, these CINCINNATI Drills are *economy-priced!* The basic 24″ machine with 6-speed vee-belt drive and hand feed—ideal for general purpose work—is only $1090 . . . only $975 for the 16″ model.



For toolroom work with many different hole diameters, the model shown at right above, has Infispeed variable speed drive and extra large work table.

If you do a lot of production drilling and tapping, you would want power feed with precision depth stop and feed disengage, and electrical tapping with automatic tap reversal, shown at right center.



Or, your CINCINNATI can provide a wide variety of economical automation, as in the fully automatic nut-tapping setup at lower right (only $4,000).

These machines are built in medium duty 16″ and 24″ sizes with 1″ capacity, heavy duty 21″ and 25″ sizes with 1½″ capacity.

*Ask your Cincinnati Lathe and Tool Dealer to recommend the exact machine for your jobs—or write to us direct.*

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"HYDRASHIFT" Lathes/"CINCINNATI" Drilling Machines/"SPIROPOINT" Drill Sharpeners

# Allocations to Be Lifted Soon

LOOK FOR steelmakers to take most of their products off the critical list by April. Instead of rationing tonnage, they'll be scrambling for every order they can get.

Signs of the shift toward a buyer's market are unmistakable. They include: 1. Offers by mills to ship more steel this month than they originally said they could. 2. Refusal by customers to take extra tonnage, coupled with requests that some shipments be deferred or canceled. 3. Price reductions by service centers and foreign steel producers. 4. Reports that Eastern mills are once again absorbing freight on shipments of hot rolled sheets to the Midwest—proof that they can't sell all they're making to customers in their own backyards.

In Chicago, steelmakers are about ready to strike "allocations" from their vocabulary. In the second quarter, they'll practice "controlled acceptance." And if new car sales don't pick up, it will be strictly a case of "hard sell."

**SHEETS STAY TIGHT—** Although most products will be easy to get by April, flat rolled steel will probably be in strong demand through June—requiring producers to maintain quotas. Tin plate and galvanizing facilities are booked solidly through the first half and beyond. Cold rolled sheets look good through June—despite some setbacks by appliance makers, producers of oil country welded pipe, and miscellaneous users. But if automakers cut their buying programs by only 5 per cent, cold rolled steel will be readily available to a host of smaller consumers. Hot rolled carbon, silicon, and enameling sheets have eased appreciably; they're no longer being allocated.

**SHIPMENTS vs. USE—** Allocations will be lifted ahead of schedule because of the unexpectedly rapid buildup of consumer stockpiles. Last month, finished steel shipments were about 25 per cent greater than consumption. Users received 8.5 million tons, chewed up 6.8 million, and added 1.7 million to inventory. This month, they'll get 8 million, use 6.4 million, and add 1.6 million to stockpiles. Thanks to the industry's tremendous capacity, strike depleted inventories of plates and structurals have been almost entirely replenished. It couldn't have been done so quickly in 1957—a year of serious shortages, but the industry has since added over 1 million tons of structural shape capacity and 1.5 million tons of plate capacity.

**OIL COUNTRY SALES DIP—** New orders for oil country goods have dropped precipitously in the last three weeks, apparently because of the credit policies that tubemakers are adopting this month. The mills announced late last year that they would withdraw their in-transit stock agreements with jobbers and tighten credit from 120 day terms to "regular" terms (2 per cent, 40 days). Result: Jobbers have decided to take only part of the steel they had ordered, canceling the rest. In the future, they'll buy most of their tonnage from mill-owned downriver terminals. With only 1710 rotary rigs operating (vs. 1781 a year ago) there are, of course, other reasons why tubing and casing aren't moving.

**PRODUCTION STEADY—** Last week steelmakers operated their furnaces at 94.5 per cent of capacity, up 0.3 point from the previous week's revised rate. Output: About 2,693,000 ingot tons. STEEL's composite price on the premium grade of heavy melting scrap dropped 50 cents to $41.50 a ton, reflecting the feeling among dealers that steelmaking operations may have passed their peak.

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*Current prices were published in the Feb. 8 issue and will appear in subsequent issues.

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WF-51R

# Luria Ties Scrap's Future to Research

**Research Director William R. Magness hopes that an improved product will stimulate greater dependence on scrap in steel expansion programs**

WHETHER YOU sell or use scrap, you stand to benefit from an extensive research and engineering program at Luria Bros. & Co. Inc., New York.

Luria's basic objective is spelled out by William R. Magness, the company's 35 year old director of research and engineering: Make scrap such an attractive product (see Pages 84, 85, 86) that when steelmakers expand they will look favorably upon processes which take large amounts of scrap.

**• Lots of Problems**—Mr. Magness and his colleagues have a rocky path to travel. New steelmaking techniques (such as use of oxygen in open hearths, which reduces scrap content of the melt from 40 to 50 per cent to around 25 to 30 per cent) have lessened the demand for purchased scrap. So has the boost in blast furnace capacity, which increases the availability of molten iron. Complicating matters: Steel companies are constantly developing ways to lower the cost of producing hot metal. And iron ores, regardless of source, can be freighted more cheaply than scrap, they say. Finally, direct reduction looms as a long term threat.

**• The Solutions**—Scrap's multiple problems, believes Mr. Magness, have to be attacked two ways: Make chemical compositions more dependable and improve the economies of scrap usage through its physical characteristics. More specifically, Luria wants to: 1. Improve quality control so the steelmaker gets a product with the lowest percentage of contaminants possible and with consistency of quality. 2. Develop better processing equipment that will lower the costs of such activities as shearing, cutting, and baling, and make it possible to produce bundles with more desirable physical characteristics.

**• Underway** — These projects are the immediate goals in the Luria research program and are actively being worked on:

- New and improved hydraulic and mechanical shears for more efficient scrap processing.
- Radically new types of scrap cutting processes that could be used by both scrap people and steel mills. Probable direction: Some kind of electrical cutting process instead of a variation of oxygen or acetylene.
- Improved methods of preventive maintenance of scrapyard equipment to make processing more efficient and to lower costs.
- Better material handling practices, such as ways to feed scrap to the shears and move it away more rapidly.
- New and better methods of preparing scrap, including refinements in incineration, shearing, compressing, burning, crushing, briqueting, stripping.

Over the longer range, one of the biggest single projects Luria researchers plan to tackle is the possible bath removal of copper contaminants in the steelmaking furnace itself, says Mr. Magness. Also on the research calendar is the whole problem of inspection. For example, how can you easily determine if a bundle is acceptable? Right now, there's no answer. At one time, radiographic inspection techniques looked promising. While the process let you know if a significant amount of nonmetallic contamination was present, it didn't adequately measure metallic inclusions.

**• From A to Z**—Eventually, virtually every phase of scrap processing may be explored by Luria researchers. Says Mr. Magness: "You can do the same type and same extent of research in scrap that you can in any other field. One reason our industry is no farther along in research today (although some good progress has been made) is because many people in both the steel and scrap industries haven't realized there is so much room for technical progress and opportunities for improvement. Research is one of the most important ways scrap can maintain, and even improve, its competitive position."

The value of scrap research to the steel industry, says Mr. Magness, will be to offer it a product with better chemical and physical properties, as well as one that might lower the ultimate processing costs of producers.

- **For the Future**—Mr. Magness sums up the Luria research philosophy like this: "The scrap industry will be faced with increasingly difficult problems as steel producers turn out consistently higher quality and more complex products. Our job will be to keep up with the metallurgical advances being made in steel."

## Tool Steel . . .

**Tool Steel Prices, Page 173**

Shipments of tool steel (excluding hollow drill steel) in December amounted to 9210 net tons, reports the American Iron & Steel Institute. The total in the preceding month was 8376 tons. In December, 1958, it was 6835.

The movement for all of 1959 was 96,069 net tons, a sharp increase compared with 68,701 in the preceding year.

## Refractories . . .

**Refractories Prices, Page 176**

H. K. Porter Company Inc., Pittsburgh, is spending about $4 million to expand and modernize plants of its Refractories Div. Almost $2 million is being spent at the Bessemer (Ala.) Works for a new factory building and storage facilities, a tunnel kiln, dryers, and new brickmaking facilities. The new facilities will increase capacity to produce ladle brick and will enable the plant to produce added lines of fire clay refractories.

At Wellsville, Ohio, about $1.5 million is being spent at McLain Works for two tunnel kilns, additional dryers, and other machinery and equipment. That project will provide additional ladle brick production capacity.

An estimated $455,000 will be invested in a new mechanized clay mine to be opened this fall at the McLain Works. New equipment will include a crusher elevator, conveyors, bins, and structures.

## Sheets, Strip . . .

**Sheet & Strip Prices, Pages 170 & 171**

Sheetmakers are looking for more hot and cold rolled sheet tonnages to fill out May and June rolling schedules, but they are still turning away new business in galvanized sheets. It's apparent consumers are rebuilding inventories quicker than had been anticipated, and pressure for deliveries is easing.

Minor cancellations and deferments have been reported, but producers so far have not had much difficulty filling gaps in schedules. They are selling more aggressively for second quarter, however, with only the coated grades in as strong demand as ever. Even the specialties are off. Stainless sheets now are available in 10 to 12 weeks, electrical grades and enameling stock by late April.

The possibility that auto demand may not live up to earlier expecta-

GOLD STAR SR

This d-c rectifier type welder does more things better than any other welder of its class because —
a. Its new transformer (Miller designed and built) has integral flux diverter.
b. Its new weld stabilized circuit delivers the ultimate in speed of metal deposition.
c. Its new completely sealed semi-metallic rectifier — designed for welding — provides the most efficient d-c for welding ever devised.

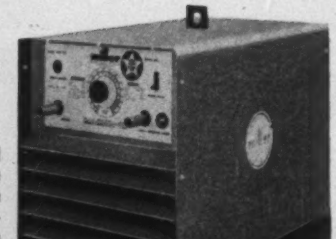
These features contribute to the Gold Star SR's greater arc stability, denser welds, easy arc starting and flexibility to handle all electrodes in all positions.

Performance-proved wherever profits are important, the Gold Star SR is available in single and duplex models of 200 to 1200 amperes at 60% duty cycle ratings.

miller WELDERS

GOLD STAR
All-Weather
SRH

The features that set the SR above and beyond the normal standards of welder performance belong to the SRH also. But, in addition to the horizontal design for easier stacking and paralleling, this welder has an "all-weather" construction that includes baked varnish coated transformers and rectifiers plus phosphatizing and painting of all base and sheet metal — even fan blades. Cam-Lok receptacles are standard equipment. The Gold Star SRH welds real well.



*Complete specifications on these Gold Star models will be sent promptly.*

miller ELECTRIC MANUFACTURING COMPANY, INC., APPLETON, WISCONSIN

• Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal

tions is causing concern. Some automakers are adjusting schedules downward. That, eventually, will affect steel shipments, possibly in June and July.

## Wire . . .

Wire Prices, Pages 171 & 172

Inquiry for wire rods and manufacturers' wire products is fairly well sustained, mill delivery promises averaging around two months. Nails and other merchant items are in easy supply. Domestic mills can make shipments in two to three weeks in some instances. Foreign products are still pouring into the country, providing keen competition, particularly at coastal points.

## French Mill Cuts Prices On Steel in Southwest

Foreign mills doing business in the Southwest are adjusting their prices downward in the face of an easier market situation.

A French mill issued a new list Feb. 4 showing moderate reductions. Examples: 2 x 2¼ in. angles, $5.70 vs. its old price of $5.88; reinforcing bars, $5.83 vs. $6.03; rounds, $5.98 vs. $6.27; flat bars, $5.98 vs. $6.27; channels, $5.74 vs. $5.92; I-beams, $5.66 vs. $5.74; wide flange beams, $6.35 vs. $6.44.

Those are base prices, f.o.b. cars, Houston dock. Delivery is promised within three to four months. Except for small sizes there are no tonnage restrictions.

## Record Steel Imports in 1959 Felt on All Coasts

Estimating steel imports in 1959 at a record 4,400,000 net tons, the American Iron & Steel Institute last week pointed out that increases were experienced at ports of entry on all shores.

During the first 11 months, imports along the Atlantic Coast jumped nearly 120 per cent from the corresponding period of 1958 to 1,300,000 tons. Arrivals at Gulf ports increased from 107,000 to 1,100,000 tons, and at West Coast ports from 280,000 to nearly 670,000 tons.

An outstanding change in the pattern of imports was an increase of 485 per cent at lake ports. Arrivals

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Leading manufacturers everywhere are cutting costs and increasing worker-safety by changing to Jomac terry cloth work gloves. Jomacs are made of thick loop-pile fabric that cushions the hands, protecting them against sharp edges and rough surfaces. They are made from various weights of cloth for specific applications. Any two make a pair, since they are completely interchangeable, and they can be reconditioned time after time—will give extraordinary wear. Fill in the coupon below for more information and a free copy of the Jomac Work Glove Catalog.

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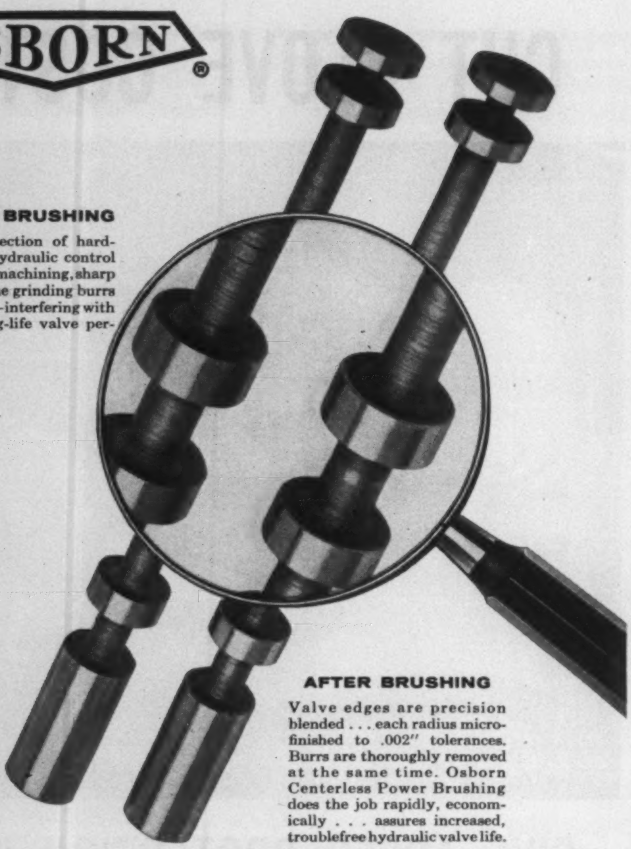

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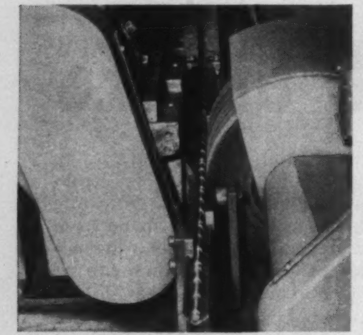
Valve edges are precision blended . . . each radius microfinished to .002″ tolerances. Burrs are thoroughly removed at the same time. Osborn Centerless Power Brushing does the job rapidly, economically . . . assures increased, troublefree hydraulic valve life.

**Microfinishing valve edges to a .002″ radius**

*. . . at rates of 1200 parts-per-hour with OSBORN Power Brushing*



**CENTERLESS BRUSHING SETUP** precision finishes hydraulic control valves at production rates of 1200 parts-per-hour. Finish blend on valve edges can be controlled to any desired microinch tolerance. Job is done on a centerless machine—with Osborn Matic® Centerless Brushes operating at 1750 rpm.

HYDRAULIC component manufacturers today—producing parts like this control valve—require ultra-high degrees of precision finishing. And Osborn Power Brushing helps meet the demands of modern high-pressure hydraulics with quality finishing, deburring and surface blending methods for hundreds of different types of parts.

In addition to the versatility and *precise quality control* afforded by Osborn Power Brushing methods—leading manufacturers also find that finishing operations are done more rapidly . . . at significantly lower cost.

An **O**sborn **B**rushing **A**nalysis—made in your plant at no cost or obligation—can pinpoint where you can speed production . . . improve quality . . . cut costs with modern Osborn Power Brushing. Write us for full details. *The Osborn Manufacturing Company, Dept. S-18, Cleveland 14, O.*

Osborn Brushes

METAL FINISHING MACHINES . . . AND METHODS
INDUSTRIAL BRUSHES • FOUNDRY PRODUCTION MACHINERY

amounted to 695,000 tons vs. 119,000 in the like period of 1958. The gain followed opening of the St. Lawrence Seaway.

A general increase in imports was also reflected at offshore customs districts in Alaska, Hawaii, and Puerto Rico, where receipts rose about 58 per cent.

## Steel Bars . . .

Bar Prices, Page 169

Evidence is accumulating that indicates finished steel production is catching up with consumer demand. While most steel products are under allocation for first quarter, allocation is too strong a word to describe marketing procedure for the second quarter. In fact, "controlled acceptance" is a term that's beginning to creep into market lingo.

Steel bars are among the products showing growing signs of easiness. However, not much hot bar tonnage is available for delivery before late April, and openings that have appeared in schedules because of cancellations have been quickly filled.

## Tin Plate . . .

Tin Plate Prices, Page 171

While tin plate is among those items in tightest supply, demand isn't quite as pressing as it has been. No cancellations have been reported, but there seems to be less concern about getting in tonnage with the mills producing in unexpectedly large volume.

Can shipments in November totaled 295,353 vs 315,759 in November, 1958, reports the U. S. Census Bureau. The movement for the first 11 months of the year was 4,627,205 tons, up from the 4,472,054 reported for the like 1958 period.

## Plates . . .

Plate Prices, Page 169

With sheared plate producers solidly booked up for the first quarter, inquiry is reported picking up for April and May delivery tonnage, but at a rate that's disappointing to most sellers. Producers still think they will be able to maintain high level operations into June, though they'll have to press harder for orders than they had expected.

Specialties, including clad plate and alloys, are available for delivery in six to eight weeks.

The strike at Bethlehem Steel's eastern shipyards is having an easing effect on the plate market. Something of a lag in railroad and heavy tank requirements also is adversely affecting volume.

## Silicon Rectifier Prices Cut by General Electric

Prices on nine types of military, low current silicon rectifiers were reduced 28 to 61 per cent by General Electric Co. (Semiconductor Products Dept.), Syracuse, N. Y. The new prices, effective Feb. 1, are attributed to improved manufacturing quality levels and increased volume.

### Distributors . . .

Prices, Page 174

U. S. Steel Supply Div., U. S. Steel Corp., revised its hot rolled carbon steel product prices Feb. 5 in the Pittsburgh, Cleveland, and St. Paul districts. The revision includes increases and decreases on individual items.

Changes in quantity extras "can result in numerous reductions in customers' costs," division officials say.

Demand is steady and is expected to gain during the next few weeks as seasonal conditions improve for the construction industry. Customers of distributors are quoting on an unusually large number of projects.

### Tubular Goods . . .

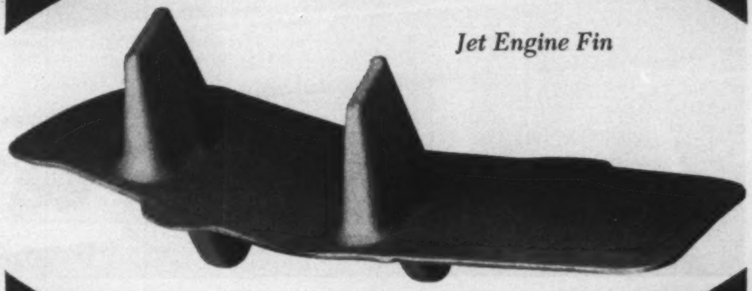
Tubular Goods Prices, Page 173

Producers of buttweld pipe are catching up on back orders, and, in general, pipe can be had for shipment within 30 days. Demand for 2 to 10 in. sizes of buttweld is active. At the same time, while requirements for 4½ and 5½ in. oil well tubing and casing is fairly brisk, some loosening up in the larger sizes is noted, partly because of a tightening in credit requirements.

Oil well drilling is substantially below that of a year ago, though rotary drilling spurted upward in the week ended Feb. 1. Hughes Tool Co.'s survey showed 1710 rigs operating, a gain of 87 over the preceding week, but off 71 from the same week a year ago.

Oil and gas men predict only

THE
PART THAT
"COULDN'T
BE
FORGED"



*Jet Engine Fin*

The jet engine fin shown above, is just one of many difficult configurations that Arcturus has forged after others said it couldn't be done. Originally these fins were machined from a forged rolled ring...a time-consuming, expensive procedure.

Using their highly-advanced techniques, Arcturus developed a method for forging the part, saving substantially on material and machining time...resulting in a cost reduction of 38%.

Chances are you are now buying machined parts that Arcturus could forge much more efficiently...saving substantially on material, weight, machining and total cost. High and low temperature alloys are our specialty. Why not send us those drawings and specifications right now?

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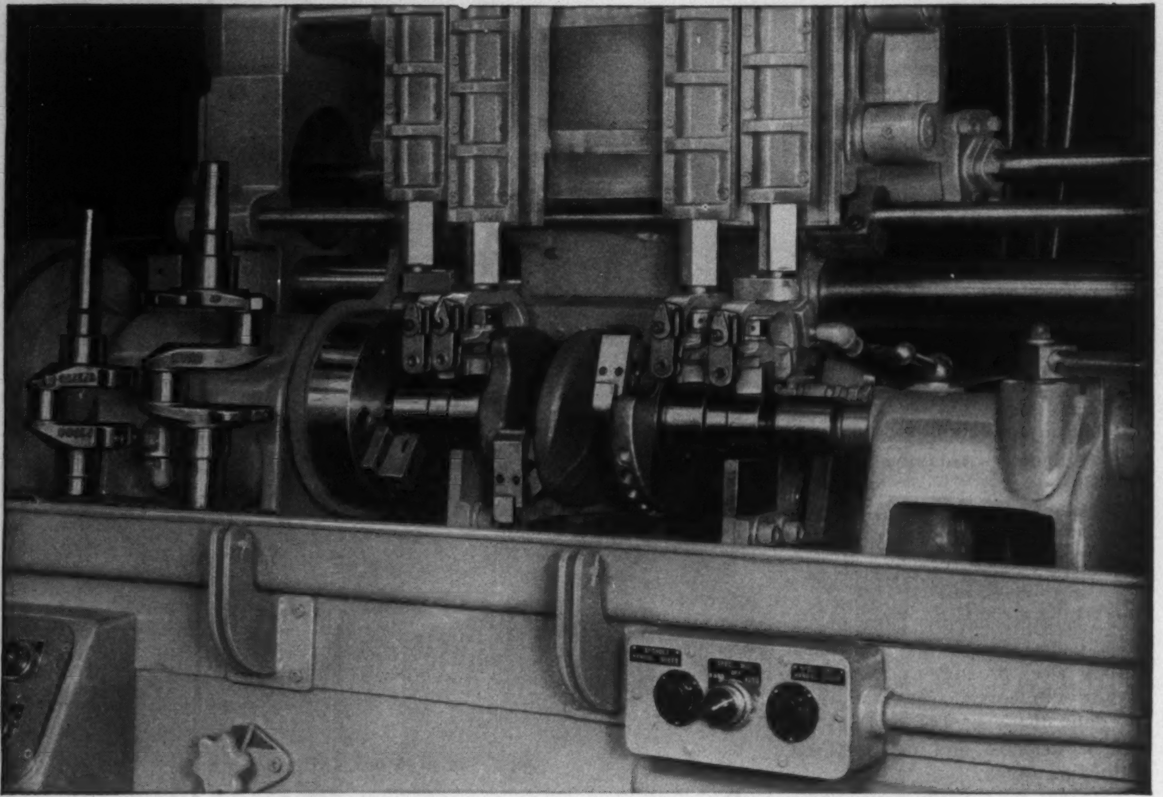

Gisholt 51A General-Purpose Superfinisher handles 44 to 53 crankshafts an hour with 80% efficiency—with one-hour change-over from one crank size to another. Each set of stones Superfinishes over 200 crankshafts on this job.

# What Onan is doing with Superfinish

## Handles crankshaft mains, pin bearings and oil seals simultaneously...gets finer finish at lower cost

There may be a tip for you in the way D. W. Onan and Sons, Inc., Minneapolis, is finishing crankshafts on a high-production basis.

Here's how a Gisholt Model 51A Superfinisher handles up to 6 different diameters in one operation, finishing a variety of single- and 2-throw crankshafts. Loading rails, with a special spindle-inching arrangement for driver positioning, make loading and unloading larger pieces fast and simple.

In a typical operating cycle, the crankshaft is driven between centers from the keyway, using a faceplate driver. Two special latch-on, follower-type arms engage with the crank pins, and 4 longitudinally adjustable quills descend to Superfinish main bearing and oil seal surfaces. Main and pin bearings are reduced from a ground surface of 30 micro-inches RMS to 8 or less. Oil seal surfaces on the shaft ends are Superfinished to 4 micro-inches or less.

Gisholt Superfinishing helps market your product more easily against rising competition. By reducing—or even eliminating—the cost of grinding, polishing, lapping or buffing operations, this modern method provides substantial savings. Chatter marks, grinding flats and amorphous "smear" metal left by grinding are completely removed, exposing true base metal for longer wear and better performance.

Ask your Gisholt Representative for details on the complete line of Superfinishing machines—including Superfinisher attachments, general-purpose models for job-lot production, and high-production models adaptable for automation. Make an appointment with him today—get the facts on this inexpensive process.

MASTERLINE GISHOLT SINCE 1887

GISHOLT

**GISHOLT**
MACHINE COMPANY
Madison 10, Wisconsin, U.S.A.

**WRITE TODAY** for "Superfinishers" (Form 1169-A), 30-page illustrated booklet explaining Gisholt Superfinishing process in interesting detail.

**ASK YOUR GISHOLT REPRESENTATIVE ABOUT GISHOLT FACTORY REBUILT MACHINES WITH NEW MACHINE GUARANTEE**

moderate increases in drilling this year. A panel of experts forecast: 49,020 wells would be drilled this year, 692 more than last year; drilling footage of 206 million ft, up 1.8 per cent.

## Publication of Iron Ore Statistics Resumed

The American Iron Ore Association reports stocks of ore in the U. S. and Canada totaled 69,912,186 gross tons at the end of November vs. 74,551,114 tons at the end of November, 1958. (Reports weren't issued during the strike.)

U. S. stocks were 66,968,300 tons vs. 71,216,426 the year preceding. Canadian stocks were 2,943,886 vs. 3,334,688 (for details see accompanying table).

Consumption of ore in the U. S. in the first 11 months of last year totaled 82,853,784 tons vs. 80,193,206 in the like period of 1958. Canadian consumption was 5,970,540 tons vs. 4,541,012. The total for U. S. and Canada was 88,829,324 vs. 84,734,218.

Foreign ore receipts in the U. S. in the period amounted to 19,522,790 tons vs. 17,162,406 in the like 11 months of 1958. Consumption of foreign ore was 14,865,542 tons vs. 14,429,974.

## Pig Iron . . .

**Pig Iron Prices, Page 174**

Demand for merchant pig iron is swinging upward. Combined with heavy demand for hot metal from steel producers, iron shipments have risen to the point where blast furnace operators are increasing production.

Hanna Furnace Corp. blew in another furnace at its Buffalo plant. Active stocks in the Chicago district total 41, highest since March, 1957. Youngstown Sheet & Tube Co. blew out its Indiana Harbor No. 1 stack Jan. 25 for relining. It will be idle about 40 days. On Feb. 4, the company relighted its No. 4 furnace at South Chicago.

Inland Steel Co. on Jan. 31 relighted its No. 5 blast furnace at Indiana Harbor Works. The hearth diameter has been increased to 26 ft 6 in. from 25 ft 9 in. The furnace will be converted to high pressure with installation of a new blowing engine early this spring.

## Iron Ore Statistics—November, 1959

**Stocks of Iron Ore and Agglomerates in the U. S. and Canada**
(Gross tons)

| | U. S. Ores | | Canadian | | Foreign | Total |
|---|---|---|---|---|---|---|
| STOCKS At | L. Superior | Other | L. Superior | Other | Ores | End of Month |
| U. S. Furnaces: | | | | | | |
| Eastern | 3,665,501 | 336,778 | 163,581 | 1,608,994 | 7,415,639 | 13,190,493 |
| Pitts-Valley | 8,325,231 | 57,452 | 992,445 | 4,005,872 | 3,680,502 | 17,061,502 |
| Cleve-Detroit | 7,682,184 | 89,989 | 862,823 | 1,098,706 | 722,147 | 10,455,849 |
| Chicago | 10,683,573 | (a) | (a) | ........ | (a) | 10,683,573 |
| Southern | (a) | 1,774,992 | ...... | (a) | 3,440,146 | 5,215,138 |
| Western | ........ | 1,028,120 | ...... | ........ | (a) | 1,028,120 |
| Total | 30,356,489 | 3,287,331 | 2,018,849 | 6,713,572 | 15,258,434 | 57,634,675 |
| At U. S. docks | | | | | | |
| Lake Erie | 3,503,946 | ...... | 317,763 | 3,011,715 | 2,500,201 | 9,333,625 |
| Other U. S. | ........ | ...... | ...... | (a) | (a) | (a) |
| Total | 3,503,946 | ...... | 317,763 | 3,011,715 | 2,500,201 | 9,333,625 |
| Total U. S. | 33,860,435 | 3,287,331 | 2,336,612 | 9,725,287 | 17,758,635 | 66,968,300 |
| Canadian stocks | 1,494,394 | ...... | 314,569 | 1,092,834 | 42,089 | 2,943,886 |
| Total U. S.-Canada | 35,354,829 | 3,287,331 | 2,651,181 | 10,818,121 | 17,800,724 | 69,912,186 |

**Consumption of Iron Ore and Agglomerates in U. S. and Canada**
(Gross tons)

| | U. S. Ores | | Canadian | | Foreign | Total |
|---|---|---|---|---|---|---|
| In U. S. Districts: | L. Superior | Other | L. Superior | Other | Ores | for Month |
| Eastern | 406,779 | 134,005 | 28,928 | 271,056 | 603,316 | 1,444,084 |
| Pitts-Valley | 1,281,816 | 56,520 | 89,242 | 483,508 | 466,966 | 2,378,052 |
| Cleve-Detroit | 691,879 | 14,370 | 183,943 | 36,822 | 124,217 | 1,051,231 |
| Chicago | 1,277,757 | (a) | (a) | ...... | (a) | 1,277,757 |
| Southern | (a) | 402,452 | ...... | (a) | 123,352 | 525,804 |
| Western | ........ | 414,140 | ...... | ...... | (a) | 414,140 |
| In U.S.: | | | | | | |
| Blast furnaces | 2,633,662 | 579,409 | 243,802 | 427,622 | 428,299 | 4,312,794 |
| Steel furnaces | 75,078 | 95,547 | 2,933 | 3,580 | 324,110 | 501,248 |
| Sintering (1) | 949,491 | 344,752 | 55,378 | 360,184 | 565,258 | 2,275,063 |
| Miscellaneous (2) | ........ | 1,779 | ...... | ...... | 184 | 1,963 |
| Total U. S. | 3,658,231 | 1,021,487 | 302,113 | 791,386 | 1,317,851 | 7,091,078 |
| In Canada: | | | | | | |
| Blast furnaces | 134,366 | ...... | 109,848 | 152,551 | ........ | 396,765 |
| Steel furnaces | 4,140 | ...... | ...... | 15,914 | 9,038 | 29,092 |
| Sintering (1) | 37,685 | ...... | 21,886 | 52,731 | ........ | 112,302 |
| Miscellaneous (2) | 34 | ...... | ...... | ...... | ........ | 34 |
| Total Canada | 176,225 | ...... | 131,734 | 221,196 | 9,038 | 538,193 |
| Total U. S.-Canada | 3,834,456 | 1,021,487 | 433,847 | 1,012,582 | 1,326,889 | 7,629,261 |

(a)—Included in other districts.
1—Consumed at plants not located at mine.
2—Sold to nonreporting companies or for purposes not listed.
Data from American Iron Ore Association.

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# Structural Shapes . . .

**Structural Shape Prices, Page 169**

Structural steel inquiry is increasing, but awards haven't picked up to any noticeable extent. Fabricators think they will be able to build up their backlogs as seasonal demand gains.

Supply appears easier. Standard shapes can be had for delivery in March, and wide flange sections for delivery in April, depending on rollings.

Nonintegrated fabricators in New England think prices on heavy shapes will rise about $8 a ton by June, 1962. They look for an initial advance in December-January, 1960-61, and a second in October-November, 1961. That compares with an $18 increase in 1956-58. If extras are revised upward, higher costs may come sooner. Forward contracts are being figured on the basis of higher plain material costs.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

8500 tons, 12 major buildings, International Airport, Los Angeles, to Kaiser Steel Corp., and Vinnel Steel Co., Los Angeles (joint venture); Robert E. McKee, General Contractor Inc., El Paso, Tex., general contractor; concrete reinforcing bars to Blue Diamond Corp., Los Angeles; steel suppliers to fabricate and erect.

3550 tons, 26 story office-hotel building, Lincoln-Liberty Insurance Co., Houston, to American Bridge Div., U. S. Steel Corp., Pittsburgh.

2400 tons, Portland generating station No. 2, Bethel Township, Pennsylvania, for Metropolitan Edison Co., Reading, Pa., to Lehigh Structural Steel Co., Allentown, Pa.

2170 tons, Niagara Parkway viaduct, Cleveland-Bellevue Avenues, Niagara Falls, N. Y., New York State Power Authority, to Bethlehem Steel Co., Bethlehem, Pa.; Coleman Bros. Corp., Readville, Mass., general contractor.

1000 tons, plant and office, Strick Trailers Inc., Falls Township, Pennsylvania, near Philadelphia, to Carew Steel Co., York, Pa.

500 tons, including reinforcing bars, engineering-architectural building, Catholic University of America, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; Victor R. Beauchamp Inc., Washington, general contractor.

425 tons, two Montana State bridges, reported placed with Midwest fabricators.

397 tons, angles, U. S. Engineer, Chicago, to Oregon Steel Mills Div., Gilmore Steel Corp., Portland, Oreg.

368 tons, angles, Navy General Stores Supply Office, Philadelphia, to Pines Steel Div., South Asia Corp., New York.

350 tons, including reinforcing bars, Holabird Junior High School, Towson, Md., to Maryland Steel Products, Baltimore (structurals), and Dietrich Bros. Inc., Baltimore (reinforcing); E. Eyring & Sons, Baltimore, general contractor.

327 tons, state bridgework, Saratoga County, New York, through Collins Bros., Mechanicsville, N. Y., to Ingalls Iron Works Co., Verona, Pa.

300 tons, plant building, National Lead Co., Old Bridge, N. J., to Keystone Structural Steel Co., Trenton, N. J.; United Engineers & Constructors, Philadelphia, in charge.

235 tons, medium and high tensile, Navy Purchasing Office, Washington, to Isaacson Iron Works, Seattle.

215 tons, extensions of ways No. 3 and 4, naval shipyard, Portsmouth, N. H., to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Ellis C. Snodgrass Inc., Portland, Maine, general contractor; also 107 tons of reinforcing bars and steel sheet piling to same shop.

205 tons, high school, Burlington, Mass., to West End Iron Works, Cambridge, Mass.; Vara Construction Co., Boston, general contractor.

120 tons, transmission towers, for Portland General Electric Co. to Poole, McGonigle & Dick, Portland, Oreg.; Charles P. Parker, Portland, general contractor.

110 tons, addition, administration building, New Jersey Turnpike Authority, New Brunswick, N. J., to Industrial Engineering Works.

60 tons, Safeway office building, Bellevue, Wash., to Leckenby Structural Steel Co., Seattle.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

8850 tons, John Day Dam, eastern Washington State, to Steel Construction Co. of Oregon, Portland, Oreg.; Montag and Associates, Portland, general contractor.

330 tons, addition for Washington State Ravenna Boulevard Freeway, to Pacific Coast Div., Bethlehem Steel Co., Seattle; MacRae Bros., Seattle, general contractor.

180 tons, Century House Apartment, 8th Ave., Seattle, to Pacific Coast Div., Bethlehem Steel Co., Seattle.

## PLATES . . .

### PLATES PLACED

3000 tons, piling, John Day Dam, Columbia River, to unstated interest.

1563 tons, carbon, Navy, General Stores Supply Office, Philadelphia, to Phoenix Steel Co., Harrisburg, Pa.

1365 tons, carbon, Navy, General Stores Supply Office, Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa.

575 tons, alloy, Navy, General Stores Supply Office, Philadelphia, to Lukens Steel Co., Coatesville, Pa.; 171 tons, steel bars (carbon) to Meldon Steel Co. Inc., Westbury, L. I., N. Y.

295 tons, carbon, Navy General Stores Supply Office, Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa.; 368 tons, carbon sheets, to Kaiser Steel Corp., New York.

150 tons, elliptical bulkheads, Naval shipyard, Portsmouth, N. H., to Lukens Steel Co., Coatesville, Pa.

147 tons, galvanized, Navy, General Stores Supply Office, Philadelphia, to Joseph P. Cattie & Bros. Inc., Philadelphia.

100 tons, Hanford Works construction, to Olympic Welding Co., Seattle; 30 tons of shapes to Union Iron Works, Seattle; W. G. Clark Construction Co., Seattle, general contractor.

### PLATES PENDING

165 tons, medium tensile, Grade M, Navy Purchasing Office, Washington; bids Feb. 15.

100 tons or more, 1 million gallon water reservoir, Lakeland Village, Medical Lake, Wash.; bids Feb. 18 to General Administration Dept., Washington State, Olympia.

## RAILS, CARS . . .

### RAILROAD CARS PLACED

Savannah & Atlanta, eight flatcars, to Ortner Co., Cincinnati; cast steel underframes and interlocking upright end posts to be supplied by General Steel Castings Corp., Granite City, Ill.

Seaboard Airline, 800 roller bearing hoppercars, 500 seventy-ton open top cars going to Huntington, W. Va., plant of ACF Industries, 200 seventy-ton covered cars going to Pullman-Standard Div., Pullman Inc., Butler, Pa., and 100 ninety-ton hoppercars to Magor Car Corp., New York.

Southern Pacific, 100 piggyback flatcars, to General American Transportation Corp., Chicago.

Great Northern, 670 freight cars, 250 fifty-ton boxcars, and ten flatcars going to ACF Industries, New York; 100 open top hoppercars and 75 covered hoppercars to Pullman-Standard Div., Pullman Inc., Chicago; 25 mill type gondolas to Ortner Co., Cincinnati; 200 boxcars to Pacific Car & Foundry Co., Renton, Wash.; and ten steel caboose cars to International Car Div., Morriston-International Corp., Buffalo.

## DISTRICT INGOT RATES

(Percentage of capacity engaged)

| | Week Ended Feb. 14 | Change | Same Week 1959 | Same Week 1958 |
|---|---|---|---|---|
| Pittsburgh | 96.5 | 0 | 82 | 57 |
| Chicago | 96 | + 0.5 | 88 | 57.5 |
| Eastern | 96 | + 1 | 84 | 76 |
| Youngstown | 95 | — 2 | 75 | 54 |
| Wheeling | 95 | — 0.5 | 79 | 57 |
| Cleveland | 103 | + 3.5* | 83 | 36.5 |
| Buffalo | 105 | 0 | 100 | 46.5 |
| Birmingham | 91.5 | 0 | 73 | 51.5 |
| Cincinnati | 102 | + 2 | 89 | 44 |
| St. Louis | 90.5 | — 8.5* | 94 | 77 |
| Detroit | 94.5 | +15* | 94 | 51.5 |
| Western | 91 | 0 | 86.5 | 66 |
| National Rate | 94.5 | + 0.3* | 83.7 | 53.5 |

## INGOT PRODUCTION

| | Week Ended Feb. 14 | Week Ago | Month Ago | Year Ago |
|---|---|---|---|---|
| INDEX (1947-49=100) | 167.6† | 167.0 | 169.8 | 147.6 |
| NET TONS (In thousands) | 2,693† | 2,683 | 2,727 | 2,371 |

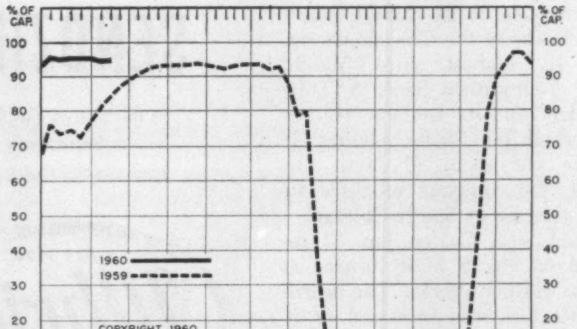
---

*Change from preceding week's revised rate.

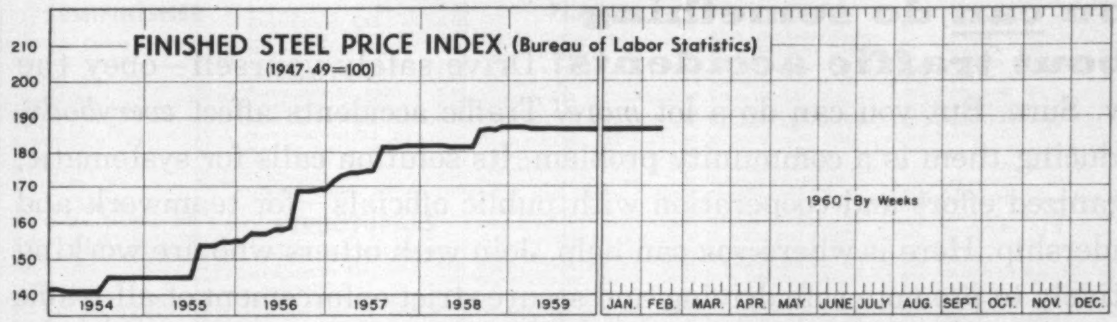
†Estimated by STEEL; comparative figures reported by AISI.

Weekly capacity (net tons): 2,849,306 in 1960; 2,831,331 in 1959; 2,699,173 in 1958.

## NATIONAL STEELWORKS OPERATIONS



# Price Indexes and Composites



| Feb. 9, 1960 | Week Ago | Month Ago | Jan. Index | Year Ago |
|---|---|---|---|---|
| 186.8 | 186.8 | 186.8 | 186.8 | 187.0 |

### AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

**Week Ended Feb. 9**

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

| | |
|---|---|
| Rails, Standard No. 1 | $5.825 |
| Rails, Light, 40 lb | 7.292 |
| Tie Plates | 6.875 |
| Axles, Railway | 10.175 |
| Wheels, Freight Car, 33 in. (per wheel) | 62.000 |
| Plates, Carbon | 6.350 |
| Structural Shapes | 6.167 |
| Bars, Tool Steel, Carbon (lb) | 0.560 |
| Bars, Tool Steel, Alloy, Oil Hardening Die (lb) | 0.680 |
| Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb) | 1.400 |
| Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb) | 1.895 |
| Bars, H.R., Alloy | 10.775 |
| Bars, H.R., Stainless, 303 (lb) | 0.543 |
| Bars, H.R., Carbon | 6.675 |
| Bars, Reinforcing | 6.385 |
| Bars, C.F., Carbon | 10.710 |
| Bars, C.F., Alloy | 14.125 |
| Bars, C.F., Stainless, 302 (lb) | 0.570 |
| Sheets, H.R., Carbon | 6.350 |
| Sheets, C.R., Carbon | 7.300 |
| Sheets, Galvanized | 8.765 |
| Sheets, C.R., Stainless, 302 (lb) | 0.658 |
| Sheets, Electrical | 12.625 |
| Strip, C.R., Carbon | 9.489 |
| Strip, C.R., Stainless, 430 (lb) | 0.480 |
| Strip, H.R., Carbon | 6.250 |
| Pipe, Black, Buttweld (100 ft) | 19.905 |
| Pipe, Galv., Buttweld (100 ft) | 23.585 |
| Pipe, Line (100 ft) | 199.533 |
| Casing, Oil Well, Carbon (100 ft) | 201.080 |
| Casing, Oil Well, Alloy (100 ft) | 315.213 |
| Tubes, Boiler (100 ft) | 51.200 |
| Tubing, Mechanical, Carbon (100 ft) | 27.005 |
| Tubing, Mechanical, Stainless, 304 (100 ft) | 205.608 |
| Tin Plate, Hot-dipped, 1.25 lb (95 lb base box) | 10.100 |
| Tin Plate, Electrolytic, 0.25 lb (95 lb base box) | 8.800 |
| Black Plate, Canmaking Quality (95 lb base box) | 7.900 |
| Wire, Drawn, Carbon | 10.575 |
| Wire, Drawn, Stainless, 430 (lb) | 0.665 |
| Bale Ties (bundles) | 7.967 |
| Nails, Wire, 8d Common | 9.825 |
| Wire, Barbed (80-rod spool) | 8.766 |
| Woven Wire Fence (20-rod roll) | 21.880 |

### STEEL's FINISHED PRICE INDEX*

| | Feb. 10 1960 | Week Ago | Month Ago | Year Ago | 5 Yr Ago |
|---|---|---|---|---|---|
| Index (1935-39 avg=100) | 247.82 | 247.82 | 247.82 | 247.82 | 194.53 |
| Index in cents per lb | 6.713 | 6.713 | 6.713 | 6.713 | 5.270 |

### STEEL's ARITHMETICAL PRICE COMPOSITES*

| | | | | | |
|---|---|---|---|---|---|
| Finished Steel, NT | $149.96 | $149.96 | $149.96 | $149.96 | $117.82 |
| No. 2 Fdry, Pig Iron, GT. | 66.49 | 66.49 | 66.49 | 66.49 | 56.54 |
| Basic Pig Iron, GT | 65.99 | 65.99 | 65.99 | 65.99 | 56.04 |
| Malleable Pig Iron, GT | 67.27 | 67.27 | 67.27 | 67.27 | 57.27 |
| Steelmaking Scrap, GT | 41.50 | 42.00 | 41.67 | 42.50 | 36.33 |

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*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

# Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

| FINISHED STEEL | Feb. 10 1960 | Week Ago | Month Ago | Year Ago | 5 Yr Ago |
|---|---|---|---|---|---|
| Bars, H.R., Pittsburgh | 5.675 | 5.675 | 5.675 | 5.675 | 4.30 |
| Bars, H.R., Chicago | 5.675 | 5.675 | 5.675 | 5.675 | 4.30 |
| Bars, H.R., deld. Philadelphia | 5.975 | 5.975 | 5.975 | 5.975 | 4.55 |
| Bars, C.R., Pittsburgh | 7.65* | 7.65* | 7.65* | 7.65* | 5.40 |
| Shapes, Std., Pittsburgh | 5.50 | 5.50 | 5.50 | 5.50 | 4.25 |
| Shapes, Std., Chicago | 5.50 | 5.50 | 5.50 | 5.50 | 4.25 |
| Shapes, deld., Philadelphia | 5.77 | 5.77 | 5.77 | 5.77 | 4.53 |
| Plates, Pittsburgh | 5.30 | 5.30 | 5.30 | 5.30 | 4.225 |
| Plates, Chicago | 5.30 | 5.30 | 5.30 | 5.30 | 4.225 |
| Plates, Coatesville, Pa. | 5.30 | 5.30 | 5.30 | 5.30 | 4.225 |
| Plates, Sparrows Point, Md. | 5.30 | 5.30 | 5.30 | 5.30 | 4.225 |
| Plates, Claymont, Del. | 5.30 | 5.30 | 5.30 | 5.30 | 4.225 |
| Sheets, H.R., Pittsburgh | 5.10 | 5.10 | 5.10 | 5.10 | 4.05 |
| Sheets, H.R., Chicago | 5.10 | 5.10 | 5.10 | 5.10 | 4.05 |
| Sheets, C.R., Pittsburgh | 6.275 | 6.275 | 6.275 | 6.275 | 4.95 |
| Sheets, C.R., Chicago | 6.275 | 6.275 | 6.275 | 6.275 | 4.95 |
| Sheets, C.R., Detroit | 6.275 | 6.275 | 6.275 | 6.275 | 5.10 |
| Sheets, Galv., Pittsburgh | 6.875 | 6.875 | 6.875 | 6.875 | 5.45 |
| Strip, H.R., Pittsburgh | 5.10 | 5.10 | 5.10 | 5.10 | 4.05 |
| Strip, H.R., Chicago | 5.10 | 5.10 | 5.10 | 5.10 | 4.05 |
| Strip, C.R., Pittsburgh | 7.425 | 7.425 | 7.425 | 7.425 | 5.75 |
| Strip, C.R., Chicago | 7.425 | 7.425 | 7.425 | 7.425 | 5.85 |
| Strip, C.R., Detroit | 7.425 | 7.425 | 7.425 | 7.425 | 5.90 |
| Wire, Basic, Pittsburgh | 8.00 | 8.00 | 8.00 | 8.00 | 5.75 |
| Nails, Wire, Pittsburgh | 8.95 | 8.95 | 8.95 | 8.95 | 6.85 |
| Tin plate (1.50 lb)box, Pitts. | $10.65 | $10.65 | $10.65 | $10.65 | $9.05 |

*Including 0.35c for special quality.

### SEMIFINISHED STEEL

| | | | | | |
|---|---|---|---|---|---|
| Billets, forging, Pitts. (NT) | $99.50 | $99.50 | $99.50 | $99.50 | $78.00 |
| Wire rods, $\frac{7}{32}$-$\frac{3}{8}$" Pitts. | 6.40 | 6.40 | 6.40 | 6.40 | 4.675 |

| PIG IRON, Gross Ton | Feb. 10 1960 | Week Ago | Month Ago | Year Ago | 5 Yr Ago |
|---|---|---|---|---|---|
| Bessemer, Pittsburgh | $67.00 | $67.00 | $67.00 | $67.00 | $57.00 |
| Basic, Valley | 66.00 | 66.00 | 66.00 | 66.00 | 56.00 |
| Basic, deld., Philadelphia | 70.41 | 70.41 | 70.41 | 70.41 | 59.66 |
| No. 2 Fdry, NevilleIsland, Pa. | 66.50 | 66.50 | 66.50 | 66.50 | 56.50 |
| No. 2 Fdry, Chicago | 66.50 | 66.50 | 66.50 | 66.50 | 56.50 |
| No. 2 Fdry, deld., Phila. | 70.91 | 70.91 | 70.91 | 70.91 | 55.16 |
| No. 2 Fdry, Birmingham | 62.50 | 62.50 | 62.50 | 62.50 | 52.88 |
| No. 2 Fdry (Birm.) deld., Cin. | 70.20 | 70.20 | 70.20 | 70.20 | 60.58 |
| Malleable, Valley | 66.50 | 66.50 | 66.50 | 66.50 | 56.50 |
| Malleable, Chicago | 66.50 | 66.50 | 66.50 | 66.50 | 56.50 |
| Ferromanganese, net ton† | 245.00 | 245.00 | 245.00 | 245.00 | 190.00 |

†74-76% Mn, Duquesne, Pa.

### SCRAP, Gross Ton (Including broker's commission)

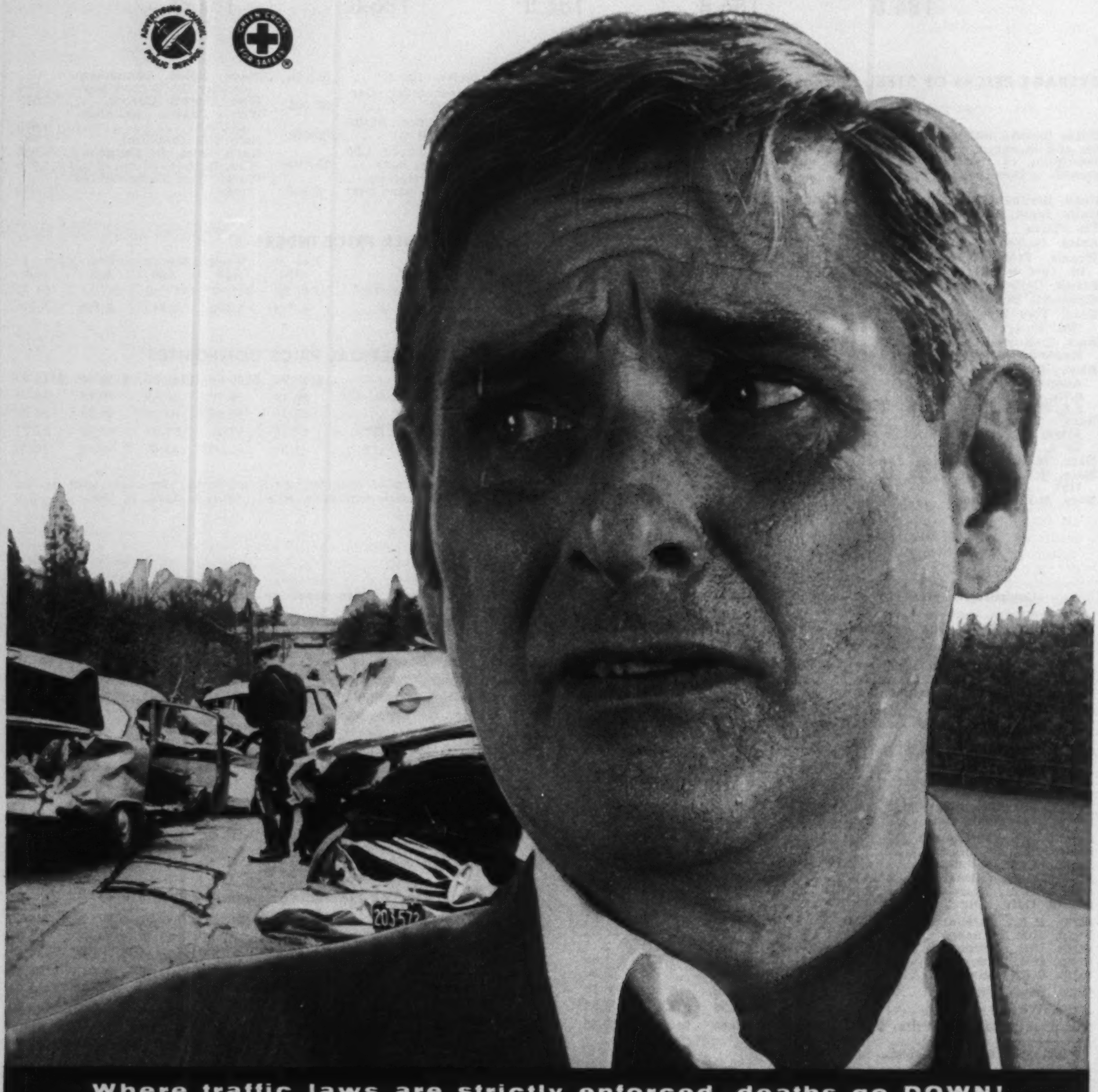
| | | | | | |
|---|---|---|---|---|---|
| No. 1 Heavy Melt, Pittsburgh | $42.50 | $42.50 | $42.50 | $43.50 | $38.00 |
| No. 1 Heavy Melt, E. Pa. | 41.00 | 42.00 | 42.00 | 40.00 | 37.00 |
| No. 1 Heavy Melt, Chicago. | 41.00 | 41.50 | 40.50 | 44.00 | 34.00 |
| No. 1 Heavy Melt, Valley | 43.50 | 47.50 | 44.50 | 48.50 | 36.50 |
| No. 1 Heavy Melt, Cleve. | 40.50 | 43.50 | 41.50 | 44.50 | 34.00 |
| No. 1 Heavy Melt, Buffalo | 36.50 | 36.50 | 37.50 | 41.50 | 32.50 |
| Rails, Rerolling, Chicago | 63.50 | 63.50 | 62.50 | 64.50 | 49.50 |
| No. 1 Cast, Chicago | 53.50 | 55.50 | 54.50 | 49.50 | 40.00 |

### COKE, Net Ton

| | | | | | |
|---|---|---|---|---|---|
| Beehive, Furn., Connlsvl. | $15.00 | $15.00 | $15.00 | $15.00 | $13.75 |
| Beehive, Fdry., Connlsvl. | 18.25 | 18.25 | 18.25 | 18.25 | 16.75 |
| Oven, Fdry., Milwaukee | 32.00 | 32.00 | 32.00 | 32.00 | 25.25 |

*"I wish I could have done something to help . . ."*

**You can do something about traffic accidents!** Drive safely yourself—obey the law. Sure. But you can do a lot *more!* Traffic accidents affect *everybody.* Reducing them is a community problem. Its solution calls for systematic, organized effort and cooperation with public officials—for teamwork and leadership. Here is where *you* can help. Join with others who are working actively to promote safe driving and secure strict enforcement of all traffic laws. Make your influence count. *Support your local Safety Council!*


203 572
Where traffic laws are strictly enforced, deaths go DOWN!

*Published in an effort to save lives, in cooperation with the National Safety Council and The Advertising Council.*

# Steel Prices

Mill prices as reported to STEEL, Feb. 10, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 170; footnotes, page 172.

## SEMIFINISHED

### INGOTS, Carbon, Forging (NT)

| | |
|---|---|
| Munhall,Pa. U5 | $76.00 |

### INGOTS, Alloy (NT)

| | |
|---|---|
| Detroit S41 | $82.00 |
| Economy,Pa. B14 | 82.00 |
| Farrell,Pa. S3 | 82.00 |
| Lowellville,O. S3 | 82.00 |
| Midland,Pa. C18 | 82.00 |
| Munhall,Pa. U5 | 82.00 |
| Sharon,Pa. S3 | 82.00 |

### BILLETS, BLOOMS & SLABS

#### Carbon, Rerolling (NT)

| | |
|---|---|
| Bartonville,Ill. K4 | $82.00 |
| Bessemer,Pa. U5 | 80.00 |
| Buffalo R2 | 80.00 |
| Clairton,Pa. U5 | 80.00 |
| Ensley,Ala. T2 | 80.00 |
| Fairfield,Ala. T2 | 80.00 |
| Fontana,Calif. K1 | 90.50 |
| Gary,Ind. U5 | 80.00 |
| Johnstown,Pa. B2 | 80.00 |
| Lackawanna,N.Y. B2 | 80.00 |
| Munhall,Pa. U5 | 80.00 |
| Owensboro,Ky. G8 | 80.00 |
| S.Chicago,Ill. R2, U5 | 80.00 |
| S.Duquesne,Pa. U5 | 80.00 |
| Sterling,Ill. N15 | 80.00 |
| Youngstown R2 | 80.00 |

#### Carbon, Forging (NT)

| | |
|---|---|
| Bessemer,Pa. U5 | $99.50 |
| Buffalo R2 | 99.50 |
| Canton,O. R2 | 102.00 |
| Clairton,Pa. U5 | 99.50 |
| Conshohocken,Pa. A3 | 104.50 |
| Ensley,Ala. T2 | 99.50 |
| Fairfield,Ala. T2 | 99.50 |
| Farrell,Pa. S3 | 99.50 |
| Fontana,Calif. K1 | 109.00 |
| Gary,Ind. U5 | 99.50 |
| Geneva,Utah C11 | 99.50 |
| Houston S5 | 104.50 |
| Johnstown,Pa. B2 | 99.50 |
| Lackawanna,N.Y. B2 | 99.50 |
| LosAngeles B3 | 109.00 |
| Midland,Pa. C18 | 99.50 |
| Munhall,Pa. U5 | 99.50 |
| Owensboro,Ky. G8 | 99.50 |
| Seattle B3 | 109.00 |
| Sharon,Pa. S3 | 99.50 |
| S.Chicago R2, U5, W14 | 99.50 |
| S.Duquesne,Pa. U5 | 99.50 |
| S.SanFrancisco B3 | 109.00 |
| Warren,O. C17 | 99.50 |

#### Alloy, Forging (NT)

| | |
|---|---|
| Bethlehem,Pa. B2 | $119.00 |
| Bridgeport,Conn. C32 | 119.00 |
| Buffalo R2 | 119.00 |
| Canton,O. R2, T7 | 119.00 |
| Conshohocken,Pa. A3 | 126.00 |
| Detroit S41 | 119.00 |
| Economy,Pa. B14 | 119.00 |
| Farrell,Pa. S3 | 119.00 |
| Fontana,Calif. K1 | 140.00 |
| Gary,Ind. U5 | 119.00 |
| Houston S5 | 124.00 |
| Ind.Harbor,Ind. Y1 | 119.00 |
| Johnstown,Pa. B2 | 119.00 |
| Lackawanna,N.Y. B2 | 119.00 |
| LosAngeles B3 | 139.00 |
| Lowellville,O. S3 | 119.00 |
| Massillon,O. R2 | 119.00 |
| Midland,Pa. C18 | 119.00 |
| Munhall,Pa. U5 | 119.00 |
| Owensboro,Ky. G8 | 119.00 |
| Sharon,Pa. S3 | 119.00 |
| S.Chicago R2,U5,W14 | 119.00 |
| S.Duquesne,Pa. U5 | 119.00 |
| Struthers,O. Y1 | 119.00 |
| Warren,O. C17 | 119.00 |

### ROUNDS, SEAMLESS TUBE (NT)

| | |
|---|---|
| Buffalo R2 | $122.50 |
| Canton,O. R2 | 125.00 |
| Cleveland R2 | 122.50 |
| Gary,Ind. U5 | 122.50 |
| S.Chicago,Ill. R2, W14 | 122.50 |
| S.Duquesne,Pa. U5 | 122.50 |
| Warren,O. C17 | 122.50 |

### SKELP

| | |
|---|---|
| Aliquippa,Pa. J5 | 5.05 |
| Ind.Harbor,Ind. Y1 | 5.05 |
| Munhall,Pa. U5 | 5.05 |
| Pittsburgh J5 | 5.05 |
| Warren,O. R2 | 5.05 |
| Youngstown R2, U5 | 5.05 |

### WIRE RODS

| | |
|---|---|
| AlabamaCity,Ala. R2 | 6.40 |
| Aliquippa,Pa. J5 | 6.40 |
| Alton,Ill. L1 | 6.60 |
| Bartonville,Ill. K4 | 6.50 |
| Buffalo W12 | 6.40 |
| Cleveland A7 | 6.40 |
| Donora,Pa. A7 | 6.40 |
| Fairfield,Ala. T2 | 6.40 |
| Houston S5 | 6.65 |
| IndianaHarbor,Ind. Y1 | 6.40 |
| Johnstown,Pa. B2 | 6.40 |
| Joliet,Ill. A7 | 6.40 |
| KansasCity,Mo. S5 | 6.65 |
| Kokomo,Ind. C16 | 6.50 |
| LosAngeles B3 | 7.20 |
| Minnequa,Colo. C10 | 6.65 |
| Monessen,Pa. P7 | 6.40 |
| Pittsburg,Calif. C11 | 7.20 |
| Portsmouth,O. P12 | 6.40 |
| Roebling,N. J. R5 | 6.50 |
| S.Chicago,Ill. R2, W14 | 6.40 |
| SparrowsPoint,Md. B2 | 6.50 |
| Sterling,Ill. (1) N15 | 6.40 |
| Sterling,Ill. N15 | 6.50 |
| Struthers,O. Y1 | 6.40 |
| Worcester,Mass. A7 | 6.70 |

## STRUCTURALS

### Carbon Steel Std. Shapes

| | |
|---|---|
| AlabamaCity,Ala. R2 | 5.50 |
| Aliquippa,Pa. J5 | 5.50 |
| Atlanta A11 | 5.70 |
| Bessemer,Ala. T2 | 5.50 |
| Bethlehem,Pa. B2 | 5.55 |
| Birmingham C15 | 5.50 |
| Clairton,Pa. U5 | 5.50 |
| Fairfield,Ala. T2 | 5.50 |
| Fontana,Calif. K1 | 6.30 |
| Gary,Ind. U5 | 5.50 |
| Geneva,Utah C11 | 5.50 |
| Houston S5 | 5.60 |
| Ind.Harbor,Ind. I-2, Y1 | 5.50 |
| Johnstown,Pa. B2 | 5.55 |
| Joliet,Ill. P22 | 5.50 |
| KansasCity,Mo. S5 | 5.60 |
| Lackawanna,N.Y. B2 | 5.55 |
| LosAngeles B3 | 6.20 |
| Minnequa,Colo. C10 | 5.80 |
| Munhall,Pa. U5 | 5.50 |
| Niles,Calif. P1 | 6.25 |
| Phoenixville,Pa. P4 | 5.55 |
| Portland,Oreg. O4 | 6.25 |
| Seattle B3 | 6.25 |
| S.Chicago, Ill. U5, W14 | 5.50 |
| S.SanFrancisco B3 | 6.15 |
| Sterling,Ill. N15 | 5.50 |
| Torrance,Calif. C11 | 6.20 |
| Weirton,W.Va. W6 | 5.50 |

### Wide Flange

| | |
|---|---|
| Bethlehem,Pa. B2 | 5.55 |
| Clairton,Pa. U5 | 5.50 |
| Fontana,Calif. K1 | 6.45 |
| IndianaHarbor,Ind. I-2 | 5.50 |
| Lackawanna,N.Y. B2 | 5.55 |
| Munhall,Pa. U5 | 5.50 |
| Phoenixville,Pa. P4 | 5.55 |
| S.Chicago,Ill. U5 | 5.50 |
| Sterling,Ill. N15 | 5.50 |
| Weirton,W.Va. W16 | 5.50 |

### Alloy Std. Shapes

| | |
|---|---|
| Aliquippa,Pa. J5 | 6.80 |
| Clairton,Pa. U5 | 6.80 |
| Gary,Ind. U5 | 6.80 |
| Houston S5 | 6.90 |
| Munhall,Pa. U5 | 6.80 |
| S.Chicago,Ill. U5, W14 | 6.80 |

### H.S., L.A., Std. Shapes

| | |
|---|---|
| Aliquippa,Pa. J5 | 8.05 |
| Bessemer,Ala. T2 | 8.05 |
| Bethlehem,Pa. B2 | 8.10 |
| Clairton,Pa. U5 | 8.05 |
| Fairfield,Ala. T2 | 8.05 |
| Fontana,Calif. K1 | 8.85 |
| Gary,Ind. U5 | 8.05 |
| Geneva,Utah C11 | 8.05 |
| Houston S5 | 8.15 |
| Ind.Harbor,Ind. I-2, Y1 | 8.05 |
| Johnstown,Pa. B2 | 8.10 |
| KansasCity,Mo. S5 | 8.15 |
| Lackawanna,N.Y. B2 | 8.10 |
| LosAngeles B3 | 8.75 |
| Munhall,Pa. U5 | 8.05 |
| Seattle B3 | 8.80 |
| S.Chicago,Ill. U5, W14 | 8.05 |
| S.SanFrancisco B3 | 8.70 |
| Sterling,Ill. N15 | 7.75 |
| Struthers,O. Y1 | 8.05 |

### H.S., L.A., Wide Flange

| | |
|---|---|
| Bethlehem,Pa. B2 | 8.10 |
| Ind.Harbor,Ind. I-2 | 8.05 |
| Lackawanna,N.Y. B2 | 8.10 |
| Munhall,Pa. U5 | 8.05 |
| S.Chicago,Ill. U5 | 8.05 |
| Sterling,Ill. N15 | 7.75 |

## PILING

### BEARING PILES

| | |
|---|---|
| Bethlehem,Pa. B2 | 5.55 |
| Ind.Harbor,Ind. I-2 | 5.50 |
| Lackawanna,N.Y. B2 | 5.55 |
| Munhall,Pa. U5 | 5.50 |
| S.Chicago,Ill. I-2, U5 | 5.50 |

### STEEL SHEET PILING

| | |
|---|---|
| Ind.Harbor,Ind. I-2 | 6.50 |
| Lackawanna,N.Y. B2 | 6.50 |
| Munhall,Pa. U5 | 6.50 |
| S.Chicago,Ill. I-2, U5 | 6.50 |
| Weirton,W.Va. W6 | 6.50 |

## PLATES

### PLATES, Carbon Steel

| | |
|---|---|
| AlabamaCity,Ala. R2 | 5.30 |
| Aliquippa,Pa. J5 | 5.30 |
| Ashland,Ky.(15) A10 | 5.30 |
| Atlanta A11 | 5.50 |
| Bessemer,Ala. T2 | 5.30 |
| Clairton,Pa. U5 | 5.30 |
| Claymont,Del. C22 | 5.30 |
| Cleveland J5, R2 | 5.30 |
| Coatesville,Pa. L7 | 5.30 |
| Conshohocken,Pa. A3 | 5.30 |
| Ecorse,Mich. G5 | 5.30 |
| Fairfield,Ala. T2 | 5.30 |
| Farrell,Pa. S3 | 5.30 |
| Fontana,Calif.(30) K1 | 6.10 |
| Gary,Ind. U5 | 5.30 |
| Geneva,Utah C11 | 5.30 |
| GraniteCity,Ill. G4 | 5.40 |
| Harrisburg,Pa. P4 | 5.30 |
| Houston S5 | 5.40 |
| Ind.Harbor,Ind. I-2, Y1 | 5.30 |
| Johnstown,Pa. B2 | 5.30 |
| Lackawanna,N.Y. B2 | 5.30 |
| Mansfield,O. E6 | 5.30 |
| Minnequa,Colo. C10 | 6.15 |
| Munhall,Pa. U5 | 5.30 |
| Newport,Ky. A2 | 5.30 |
| Pittsburgh J5 | 5.30 |
| Riverdale,Ill. A1 | 5.30 |
| Seattle B3 | 6.20 |
| Sharon,Pa. S3 | 5.30 |
| S.Chicago,Ill. U5, W14 | 5.30 |
| SparrowsPoint,Md. B2 | 5.30 |
| Sterling,Ill. N15 | 5.30 |
| Steubenville,O. W10 | 5.30 |
| Warren,O. R2 | 5.30 |
| Youngstown U5, Y1 | 5.30 |
| Youngstown(27) R2 | 5.30 |

### PLATES, Carbon Abras. Resist.

| | |
|---|---|
| Claymont,Del. C22 | 7.05 |
| Fontana,Calif. K1 | 7.85 |
| Geneva,Utah C11 | 7.05 |
| Houston S5 | 7.15 |
| Johnstown,Pa. B2 | 7.05 |
| SparrowsPoint,Md. B2 | 7.05 |

### PLATES, Wrought Iron

| | |
|---|---|
| Economy,Pa. B14 | 14.10 |

### PLATES, H.S., L.A.

| | |
|---|---|
| Aliquippa,Pa. J5 | 7.95 |
| Ashland,Ky. A10 | 7.95 |
| Bessemer,Ala. T2 | 7.95 |
| Clairton,Pa. U5 | 7.95 |
| Claymont,Del. C22 | 7.95 |
| Cleveland J5, R2 | 7.95 |
| Coatesville,Pa. L7 | 7.95 |
| Conshohocken,Pa. A3 | 7.95 |
| Economy,Pa. B14 | 7.95 |
| Ecorse,Mich. G5 | 7.95 |
| Fairfield,Ala. T2 | 7.95 |
| Farrell,Pa. S3 | 7.95 |
| Fontana,Calif.(30) K1 | 8.75 |
| Gary,Ind. U5 | 7.95 |
| Geneva,Utah C11 | 7.95 |
| Houston S5 | 8.05 |
| Ind.Harbor,Ind. I-2, Y1 | 7.95 |
| Johnstown,Pa. B2 | 7.95 |
| Munhall,Pa. U5 | 7.95 |
| Pittsburgh J5 | 7.95 |
| Seattle B3 | 8.85 |
| Sharon,Pa. S3 | 7.95 |
| S.Chicago,Ill. U5, W14 | 7.95 |
| SparrowsPoint,Md. B2 | 7.95 |
| Warren,O. R2 | 7.95 |
| Youngstown U5, Y1 | 7.95 |

### PLATES, Alloy

| | |
|---|---|
| Aliquippa,Pa. J5 | 7.50 |
| Claymont,Del. C22 | 7.50 |
| Coatesville,Pa. L7 | 7.50 |
| Economy,Pa. B14 | 7.50 |
| Farrell,Pa. S3 | 7.50 |
| Fontana,Calif. K1 | 8.30 |
| Gary,Ind. U5 | 7.50 |
| Houston S5 | 7.60 |
| Ind.Harbor,Ind. Y1 | 7.50 |
| Johnstown,Pa. B2 | 7.50 |
| Lowellville,O. S3 | 7.50 |
| Munhall,Pa. U5 | 7.50 |
| Newport,Ky. A2 | 7.50 |
| Pittsburgh J5 | 7.50 |
| Seattle B3 | 8.40 |
| Sharon,Pa. S3 | 7.50 |
| S.Chicago,Ill. U5, W14 | 7.50 |
| SparrowsPoint,Md. B2 | 7.50 |
| Youngstown Y1 | 7.50 |

### FLOOR PLATES

| | |
|---|---|
| Cleveland J5 | 6.375 |
| Conshohocken,Pa. A3 | 6.375 |
| Ind.Harbor,Ind. I-2 | 6.375 |
| Munhall,Pa. U5 | 6.375 |
| Pittsburgh J5 | 6.375 |
| S.Chicago,Ill. U5 | 6.375 |

### PLATES, Ingot Iron

| | |
|---|---|
| Ashland c.l. (15) A10 | 5.55 |
| Ashland l.c.l. (15) A10 | 6.05 |
| Cleveland c.l. R2 | 6.05 |
| Warren,O. R2 | 6.05 |

## BARS

### BARS, Hot-Rolled Carbon (Merchant Quality)

| | |
|---|---|
| Ala.City,Ala.(9) R2 | 5.675 |
| Aliquippa,Pa.(9) J5 | 5.675 |
| Alton,Ill. L1 | 5.875 |
| Atlanta(9) A11 | 5.875 |
| Bessemer,Ala.(9) T2 | 5.675 |
| Birmingham(9) C15 | 5.675 |
| Buffalo(9) R2 | 5.675 |
| Canton,O(23) R2 | 6.15 |
| Clairton,Pa.(9) U5 | 5.675 |
| Cleveland(9) R2 | 5.675 |
| Ecorse,Mich.(9) G5 | 5.675 |
| Emeryville,Calif. J7 | 6.425 |
| Fairfield,Ala.(9) T2 | 5.675 |
| Fairless,Pa.(9) U5 | 5.825 |
| Fontana,Calif.(9) K1 | 6.375 |
| Gary,Ind.(9) U5 | 5.675 |
| Houston(9) S5 | 5.925 |
| Ind.Harbor(9) I-2, Y1 | 5.675 |
| Johnstown,Pa.(9) B2 | 5.675 |
| Joliet,Ill. P2 | 5.675 |
| KansasCity,Mo(9) S5 | 5.925 |
| Lackawanna(9) B2 | 5.675 |
| LosAngeles(9) B3 | 6.375 |
| Massillon,O.(23) R2 | 6.15 |
| Midland,Pa. (23) C18 | 6.025 |
| Milton,Pa. M18 | 5.825 |
| Minnequa,Colo. C10 | 6.125 |
| Niles,Calif. P1 | 6.375 |
| Owensboro,Ky.(9) G8 | 6.025 |
| Pittsburg,Calif.(9) C11 | 6.375 |
| Pittsburgh(9) J5 | 5.675 |
| Portland,Oreg. O4 | 6.425 |
| Riverdale,Ill.(9) A1 | 5.675 |
| Seattle A24, B3, N15 | 6.425 |
| S.Ch'c'go(9)R2,U5,W14 | 5.675 |
| S.Duquesne,Pa.(9) U5 | 5.675 |
| S.SanFran.,Calif.(9)B3 | 6.425 |
| Sterling,Ill.(1)(9) N15 | 5.675 |
| Sterling,Ill.(9) N15 | 5.775 |
| Struthers,O.(9) Y1 | 5.675 |
| Tonawanda,N.Y. B12 | 5.675 |
| Torrance,Calif.(9) C11 | 6.375 |
| Warren,O. C17 | 6.052 |
| Youngstown(9) R2,U5 | 5.675 |

### BARS, Hot-Rolled Alloy

| | |
|---|---|
| Aliquippa,Pa. J5 | 6.725 |
| Bethlehem,Pa. B2 | 6.725 |
| Bridgeport,Conn. C32 | 6.80 |
| Buffalo R2 | 6.725 |
| Canton,O. R2, T7 | 6.725 |
| Clairton,Pa. U5 | 6.725 |
| Detroit S41 | 6.725 |
| Economy,Pa. B14 | 6.725 |
| Ecorse,Mich. G5 | 6.725 |
| Fairless,Pa. U5 | 6.875 |
| Farrell,Pa. S3 | 6.725 |
| Fontana,Calif. K1 | 7.775 |
| Gary,Ind. U5 | 6.725 |
| Houston S5 | 6.975 |
| Ind.Harbor,Ind. I-2, Y1 | 6.725 |
| Johnstown,Pa. B2 | 6.725 |
| KansasCity,Mo. S5 | 6.975 |
| Lackawanna,N.Y. B2 | 6.725 |
| LosAngeles B3 | 7.775 |
| Lowellville,O. S3 | 6.725 |
| Massillon,O. R2 | 6.725 |
| Midland,Pa. C18 | 6.725 |
| Owensboro,Ky. G8 | 6.725 |
| Pittsburgh J5 | 6.725 |
| Sharon,Pa. S3 | 6.725 |
| S.Chicago R2, U5, W14 | 6.725 |
| S.Duquesne,Pa. U5 | 6.725 |
| Struthers,O. Y1 | 6.725 |
| Warren,O. C17 | 6.725 |
| Youngstown U5 | 6.725 |

### BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy

| | |
|---|---|
| Aliquippa,Pa. J5 | 8.30 |
| Bessemer,Ala. T2 | 8.30 |
| Bethlehem,Pa. B2 | 8.30 |
| Clairton,Pa. U5 | 8.30 |
| Cleveland R2 | 8.30 |
| Ecorse,Mich. G5 | 8.30 |
| Fairfield,Ala. T2 | 8.30 |
| Fontana,Calif. K1 | 9.00 |
| Gary,Ind. U5 | 8.30 |
| Houston S5 | 8.55 |
| Ind.Harbor,Ind. Y1 | 8.30 |
| Johnstown,Pa. B2 | 8.30 |
| KansasCity,Mo. S5 | 8.55 |
| Lackawanna,N.Y. B2 | 8.30 |
| LosAngeles B3 | 9.00 |
| Pittsburgh J5 | 8.30 |
| Seattle B3 | 9.05 |
| S.Chicago,Ill. R2 W14 | 8.30 |
| S.Duquesne,Pa. U5 | 8.30 |
| S.SanFrancisco B3 | 9.05 |
| Struthers,O. Y1 | 8.30 |
| Youngstown U5 | 8.30 |

### BAR SIZE ANGLES; H.R. Carbon

| | |
|---|---|
| Bethlehem,Pa.(9) B2 | 5.825 |
| Houston(9) S5 | 5.925 |
| KansasCity,Mo.(9) S5 | 5.925 |
| Lackawanna(9) B2 | 5.675 |
| Sterling,Ill. N15 | 5.775 |
| Sterling,Ill.(1) N15 | 5.675 |
| Tonawanda,N.Y. B12 | 5.675 |

### BAR SIZE ANGLES; S. SHAPES

| | |
|---|---|
| Aliquippa,Pa. J5 | 5.675 |
| Atlanta A11 | 5.875 |
| Joliet,Ill. P22 | 5.675 |
| Minnequa,Colo. C10 | 6.125 |
| Niles,Calif. P1 | 6.375 |
| Pittsburgh J5 | 5.675 |
| Portland,Oreg. O4 | 6.425 |
| SanFrancisco S7 | 6.52 |
| Seattle B3 | 6.425 |

### BAR SIZE ANGLES; S. SHAPES Wrought Iron

| | |
|---|---|
| Economy,Pa. B14 | 16.45 |

### BAR SHAPES, Hot-Rolled Alloy

| | |
|---|---|
| Aliquippa,Pa. J5 | 6.80 |
| Clairton,Pa. U5 | 6.80 |
| Gary,Ind. U5 | 6.80 |
| Houston S5 | 7.05 |
| KansasCity,Mo. S5 | 7.05 |
| Pittsburgh J5 | 6.80 |
| Youngstown U5 | 6.80 |

### BARS, C.F. Leaded (Including leaded extra)

#### Carbon

| | |
|---|---|
| LosAngeles P2, S30 | 11.75* |

#### Alloy

| | |
|---|---|
| Ambridge,Pa. W18 | 10.175 |
| BeaverFalls,Pa. M12 | 10.175 |
| Camden,N.J. P13 | 10.35 |
| Chicago W18 | 10.175 |
| Elyria,O. W8 | 10.175 |
| Monaca,Pa. S17 | 10.175 |
| Newark,N.J. W18 | 10.35 |
| SpringCity,Pa. K3 | 10.35 |

*Grade A; add 0.05c for Grade B.

### BARS, Cold-Finished Carbon

| | |
|---|---|
| Ambridge,Pa. W18 | 7.65 |
| BeaverFalls,Pa. M12,R2 | 7.65 |
| Birmingham C15 | 8.25 |
| Buffalo B5 | 7.70 |
| Camden,N.J. P13 | 8.10 |
| Carnegie,Pa. C12 | 7.65 |
| Chicago W18 | 7.65 |
| Cleveland A7, C20 | 7.65 |
| Detroit B5, P17 | 7.85 |
| Detroit S41 | 7.65 |
| Donora,Pa. A7 | 7.65 |
| Elyria,O. W8 | 7.65 |
| FranklinPark,Ill. N5 | 7.65 |
| Gary,Ind. R2 | 7.65 |
| GreenBay,Wis. F7 | 7.65 |
| Hammond,Ind. J5, L2 | 7.65 |
| Hartford,Conn. R2 | 8.15 |
| Harvey,Ill. B5 | 7.65 |
| LosAngeles(49) S30 | 9.10 |
| LosAngeles(49) P2, R2 | 9.10 |
| Mansfield,Mass. B5 | 8.20 |
| Massillon,O. R2, R8 | 7.65 |
| Midland,Pa. C18 | 7.65 |
| Monaca,Pa. S17 | 7.65 |
| Newark,N. J. W18 | 8.10 |
| NewCastle,Pa.(17) B4 | 7.65 |
| Pittsburgh J5 | 7.65 |
| Plymouth,Mich. P5 | 7.90 |
| Putnam,Conn. W18 | 8.20 |
| Readville,Mass. C14 | 8.20 |
| S.Chicago,Ill. W14 | 7.65 |
| SpringCity,Pa. K3 | 8.10 |
| Struthers,O. Y1 | 7.65 |
| Warren,O. C17 | 7.65 |
| Waukegan,Ill. A7 | 7.65 |
| Willimantic,Conn. J5 | 8.15 |
| Youngstown F3, Y1 | 7.65 |

### BARS, Cold-Finished Carbon (Turned and Ground)

| | |
|---|---|
| Cumberland,Md.(5) C19 | 6.55 |

### BARS, Cold-Finished Alloy

| | |
|---|---|
| Ambridge,Pa. W18 | 9.025 |
| BeaverFalls,Pa.M12,R2 | 9.025 |
| Bethlehem,Pa. B2 | 9.025 |
| Bridgeport,Conn. C32 | 9.175 |
| Buffalo B5 | 9.025 |
| Camden,N.J. P13 | 9.20 |
| Canton,O. T7 | 9.025 |
| Carnegie,Pa. C12 | 9.025 |
| Chicago W18 | 9.025 |
| Cleveland A7, C20 | 9.025 |
| Detroit B5, P17 | 9.225 |
| Detroit S41 | 9.025 |
| Donora,Pa. A7 | 9.025 |
| Elyria,O. W8 | 9.025 |
| FranklinPark,Ill. N5 | 9.025 |
| Gary,Ind. R2 | 9.025 |
| GreenBay,Wis F7 | 9.025 |
| Hammond,Ind. J5, L2 | 9.025 |
| Hartford, Conn. R2 | 9.325 |
| Harvey,Ill. R5 | 9.025 |
| Lackawanna,N.Y. B2 | 9.025 |
| LosAngeles P2, S30 | 11.00 |
| Mansfield,Mass. B5 | 9.325 |
| Massillon,O. R2, R8 | 9.025 |
| Midland,Pa. C18 | 9.025 |
| Monaca,Pa. S17 | 9.025 |
| Newark,N.J. W18 | 9.20 |
| Plymouth,Mich. P5 | 9.225 |
| S.Chicago,Ill. W14 | 9.025 |
| SpringCity,Pa. K3 | 9.20 |
| Struthers,O. Y1 | 9.025 |
| Warren,O. C17 | 9.025 |

| | |
|---|---|
| Waukegan,Ill. A7 | 9.025 |
| Willimantic,Conn. J5 | 9.325 |
| Worcester,Mass. A7 | 9.325 |
| Youngstown F3, Y1 | 9.025 |

### BARS, Reinforcing, Billet (To Fabricators)

| | |
|---|---|
| AlabamaCity,Ala. R2 | 5.675 |
| Atlanta A11 | 5.675 |
| Birmingham C15 | 5.675 |
| Buffalo R2 | 5.675 |
| Cleveland R2 | 5.675 |
| Ecorse,Mich. G5 | 5.675 |
| Emeryville,Calif. J7 | 6.425 |
| Fairfield,Ala. T2 | 5.675 |
| Fairless,Pa. U5 | 5.825 |
| Fontana,Calif. K1 | 6.375 |
| Ft.Worth,Tex(4)(26)T4 | 5.925 |
| Gary,Ind. U5 | 5.675 |
| Houston S5 | 5.925 |
| Ind.Harbor,Ind. I-2,Y1 | 5.675 |
| Johnstown,Pa. B2 | 5.675 |
| Joliet,Ill. P22 | 5.675 |
| KansasCity,Mo. S5 | 5.925 |
| Kokomo,Ind. C16 | 5.775 |
| Lackawanna,N.Y. B2 | 5.675 |
| LosAngeles B3 | 6.375 |
| Madison,Ill. L1 | 5.875 |
| Milton,Pa. M18 | 5.825 |
| Minnequa,Colo. C10 | 6.125 |
| Niles,Calif. P1 | 6.375 |
| Pittsburg,Calif. C11 | 6.375 |
| Pittsburgh J5 | 5.675 |
| Portland,Oreg. O4 | 6.425 |
| SandSprings,Okla. S5 | 5.925 |
| Seattle A24, B3, N14 | 6.425 |
| S.Chicago,Ill. R2, W14 | 5.675 |
| S.Duquesne,Pa. U5 | 5.675 |
| S.SanFrancisco B3 | 6.425 |
| SparrowsPoint,Md. B2 | 5.675 |
| Sterling,Ill. (1) N15 | 5.675 |
| Sterling,Ill. N15 | 5.775 |
| Struthers,O. Y1 | 5.675 |
| Tonawanda,N.Y. B12 | 6.10 |
| Torrance,Calif. C11 | 6.375 |
| Youngstown R2, U5 | 5.675 |

### BARS, Reinforcing, Billet (Fabricated: To Consumers)

| | |
|---|---|
| Baltimore B2 | 7.42 |
| Boston B2, U8 | 8.15 |
| Chicago U8 | 7.41 |
| Cleveland U8 | 7.39 |
| Houston S5 | 7.60 |
| Johnstown,Pa. B2 | 7.33 |
| KansasCity,Mo. S5 | 7.60 |
| Lackawanna,N.Y. B2 | 7.35 |
| Marion,O. P11 | 6.70 |
| Newark,N.J. U8 | 7.80 |
| Philadelphia U8 | 7.63 |
| Pittsburgh J5, U8 | 7.35 |
| SandSprings,Okla. S5 | 7.60 |
| Seattle A24, B3, N14 | 7.95 |
| SparrowsPt.,Md. B2 | 7.33 |
| St.Paul U8 | 8.17 |
| Williamsport,Pa. S19 | 7.25 |

### BARS, Wrought Iron

| | |
|---|---|
| Economy,Pa.(S.R.)B14 | 15.10 |
| Economy,Pa.(D.R.)B14 | 19.30 |
| Econ.(DirectRolled)B14 | 13.55 |
| Economy(Staybolt)B14 | 19.80 |
| McK.Rks.(S.R.) L5 | 14.50 |
| McK.Rks.(D.R.) L5 | 19.80 |
| McK.Rks.(Staybolt)L5. | 20.95 |

### BARS, Rail Steel

| | |
|---|---|
| ChicagoHts.(3) C2, I-2 | 5.575 |
| ChicagoHts.(4)(44) I-2 | 5.675 |
| ChicagoHts. (4) C2 | 5.675 |
| Franklin,Pa. (3) F5 | 5.575 |
| Franklin,Pa.(4) F5 | 5.675 |
| JerseyShore,Pa.(3) J8 | 5.55 |
| Marion,O. (3) P11 | 5.575 |
| Tonawanda (3) B12 | 5.575 |
| Tonawanda(4) B12 | 6.10 |

## SHEETS

### SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

| | |
|---|---|
| AlabamaCity,Ala. R2 | 5.10 |
| Allenport,Pa. P7 | 5.10 |
| Aliquippa,Pa. J5 | 5.10 |
| Ashland,Ky.(8) A10 | 5.10 |
| Cleveland J5, R2 | 5.10 |
| Conshohocken,Pa. A3 | 5.15 |
| Detroit(8) M1 | 5.10 |
| Ecorse,Mich. G5 | 5.10 |
| Fairfield,Ala. T2 | 5.10 |
| Fairless,Pa. U5 | 5.15 |
| Farrell,Pa. S3 | 5.10 |
| Fontana,Calif. K1 | 5.825 |
| Gary,Ind. U5 | 5.10 |
| Geneva,Utah C11 | 5.20 |
| GraniteCity,Ill.(8) G4 | 5.20 |
| Ind.Harbor,Ind. I-2, Y1 | 5.10 |
| Irvin,Pa. U5 | 5.10 |
| Lackawanna,N.Y. B2 | 5.10 |
| Mansfield,O. E6 | 5.10 |
| Munhall,Pa. U5 | 5.10 |
| Newport,Ky. A2 | 5.10 |
| Niles,O. M21, S3 | 5.10 |
| Pittsburg,Calif. C11 | 5.80 |
| Pittsburgh J5 | 5.10 |
| Portsmouth,O. P12 | 5.10 |
| Riverdale,Ill. A1 | 5.10 |
| Sharon,Pa. S3 | 5.10 |
| S.Chicago,Ill. U5, W14 | 5.10 |
| SparrowsPoint,Md. B2 | 5.10 |
| Steubenville,O. W10 | 5.10 |
| Warren,O. R2 | 5.10 |
| Weirton,W.Va. W6 | 5.10 |
| Youngstown U5, Y1 | 5.10 |

### SHEETS, H.R. (19 Ga. & Lighter)

| | |
|---|---|
| Niles,O. M21, S3 | 6.275 |

### SHEETS, H.R., Alloy

| | |
|---|---|
| Gary,Ind. U5 | 8.40 |
| Ind.Harbor,Ind. Y1 | 8.40 |
| Irvin,Pa. U5 | 8.40 |
| Munhall,Pa. U5 | 8.40 |
| Newport,Ky. A2 | 8.40 |
| Youngstown U5, Y1 | 8.40 |

### SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

| | |
|---|---|
| Aliquippa,Pa. J5 | 7.525 |
| Ashland,Ky. A10 | 7.525 |
| Cleveland J5, R2 | 7.525 |
| Conshohocken,Pa. A3 | 7.575 |
| Ecorse,Mich. G5 | 7.525 |
| Fairfield,Ala. T2 | 7.525 |
| Fairless,Pa. U5 | 7.575 |
| Farrell,Pa. S3 | 7.525 |
| Fontana,Calif. K1 | 8.25 |
| Gary,Ind. U5 | 7.525 |
| Ind.Harbor,Ind. I-2, Y1 | 7.525 |
| Irvin,Pa. U5 | 7.525 |
| Lackawanna(35) B2 | 7.525 |
| Munhall,Pa. U5 | 7.525 |
| Niles,O. S3 | 7.525 |
| Pittsburgh J5 | 7.525 |
| S.Chicago,Ill. U5, W14 | 7.525 |
| Sharon,Pa. S3 | 7.525 |
| SparrowsPoint(36) B2 | 7.525 |
| Warren,O. R2 | 7.525 |
| Weirton,W.Va. W6 | 7.525 |
| Youngstown U5, Y1 | 7.525 |

### SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

| | |
|---|---|
| Ashland,Ky. (8) A10 | 5.35 |
| Cleveland R2 | 5.875 |
| Warren,O. R2 | 5.875 |

### SHEETS, Cold-Rolled Ingot Iron

| | |
|---|---|
| Cleveland R2 | 7.05 |
| Middletown,O. A10 | 6.775 |
| Warren,O. R2 | 7.05 |

### SHEETS, Cold-Rolled Steel (Commercial Quality)

| | |
|---|---|
| AlabamaCity,Ala. R2 | 6.275 |
| Aliquippa,Pa. J5 | 6.275 |
| Allenport,Pa. P7 | 6.275 |
| Cleveland J5, R2 | 6.275 |
| Conshohocken,Pa. A3 | 6.325 |
| Detroit M1 | 6.275 |
| Ecorse,Mich. G5 | 6.275 |
| Fairfield,Ala. T2 | 6.275 |
| Fairless,Pa. U5 | 6.325 |
| Follansbee,W.Va. F4 | 6.275 |
| Fontana,Calif. K1 | 7.40 |
| Gary,Ind. U5 | 6.275 |
| GraniteCity,Ill. G4 | 6.375 |
| Ind.Harbor,Ind. I-2, Y1 | 6.275 |
| Irvin,Pa. U5 | 6.275 |
| Lackawanna,N.Y. B2 | 6.275 |
| Mansfield,O. E6 | 6.275 |
| Middletown,O. A10 | 6.275 |
| Newport,Ky. A2 | 6.275 |
| Pittsburg,Calif. C11 | 7.225 |
| Pittsburgh J5 | 6.275 |
| Portsmouth,O. P12 | 6.275 |
| SparowsPoint,Md. B2 | 6.275 |
| Steubenville,O. W10 | 6.275 |
| Warren,O. R2 | 6.275 |
| Weirton,W.Va. W6 | 6.275 |
| Yorkville,O. W10 | 6.275 |
| Youngstown Y1 | 6.275 |

### SHEETS, Cold-Rolled, High-Strength, Low-Alloy

| | |
|---|---|
| Aliquippa,Pa. J5 | 9.275 |
| Cleveland J5, R2 | 9.275 |
| Ecorse,Mich. G5 | 9.275 |
| Fairless,Pa. U5 | 9.325 |
| Fontana,Calif. K1 | 10.40 |
| Gary,Ind. U5 | 9.275 |
| Ind.Harbor,Ind. I-2, Y1 | 9.275 |
| Lackawanna(37) B2 | 9.275 |
| Pittsburgh J5 | 9.275 |
| SparrowsPoint(38) B2 | 9.275 |
| Warren,O. R2 | 9.275 |
| Weirton,W.Va. W6 | 9.275 |
| Youngstown Y1 | 9.275 |

### SHEETS, Culvert

| | Cu Steel | Cu Fe |
|---|---|---|
| Ala.City,Ala. R2 | 7.225 | .... |
| Ashland,Ky. A10 | 7.225 | 7.475 |
| Canton,O. R2 | 7.225 | .... |
| Fairfield,Ala. T2 | 7.225 | 7.475 |
| Gary,Ind. U5 | 7.225 | 7.475 |
| GraniteCity,Ill. G4 | 7.325 | .... |
| Ind.Harbor I-2 | 7.225 | 7.475 |
| Irvin,Pa. U5 | 7.225 | 7.475 |
| Kokomo,Ind. C16 | 7.325 | .... |
| MartinsFry. W10 | 7.225 | 7.475 |
| Pitts.,Calif. C11 | 7.975 | .... |
| Pittsburgh J5 | 7.225 | .... |
| SparrowsPt. B2 | 7.225 | .... |

### SHEETS, Culvert—Pure Iron

| | |
|---|---|
| Ind.Harbor,Ind. I-2 | 7.475 |

### SHEETS, Galvanized Steel Hot-Dipped

| | |
|---|---|
| AlabamaCity,Ala. R2 | 6.875‡ |
| Ashland,Ky. A10 | 6.875‡ |
| Canton,O. R2 | 6.875‡ |
| Dover,O. E6 | 6.875† |
| Fairfield,Ala. T2 | 6.875† |
| Gary,Ind. U5 | 6.875† |
| GraniteCity,Ill. G4 | 6.975* |
| Ind.Harbor,Ind. I-2 | 6.875† |
| Irvin,Pa. U5 | 6.875† |
| Kokomo,Ind. C-16 | 6.975‡ |
| MartinsFerry,O. W10 | 6.875* |
| Middletown,O. A10 | 6.875† |
| Pittsburg, Calif. C11 | 7.625* |
| Pittsburgh J5 | 6.875† |
| SparrowsPt.,Md. B2 | 6.875† |
| Warren,O. R2 | 6.875† |
| Weirton,W.Va. W6 | 6.875* |

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*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

### SHEETS, Galvanized High-Strength, Low-Alloy

| | |
|---|---|
| Irvin,Pa. U5 | 10.125 |
| Pittsburgh J5 | 10.125 |
| SparrowsPt.(39) B2 | 10.025 |

### SHEETS, Galvannealed Steel

| | |
|---|---|
| Canton,O. R2 | 7.275 |
| Irvin,Pa. U5 | 7.275 |

### SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

| | |
|---|---|
| Ashland,Ky. A10 | 7.125 |
| Middletown,O. A10 | 7.125 |

### SHEETS, Electrogalvanized

| | |
|---|---|
| Cleveland(28) R2 | 7.65 |
| Niles,O.(28) R2 | 7.65 |
| Weirton,W.Va. W6 | 7.50 |
| Youngstown J5 | 7.50 |

### SHEETS, Well Casing

| | |
|---|---|
| Fontana,Calif. K1 | 7.325 |

### SHEETS, Aluminum Coated

| | |
|---|---|
| Butler,Pa. A10 (type 1) | 9.525 |
| Butler,Pa. A10 (type 2) | 9.625 |
| Irvin,Pa. U5 (type 1) | 9.525 |

### SHEETS, Enameling Iron

| | |
|---|---|
| Ashland,Ky. A10 | 6.775 |
| Cleveland R2 | 6.775 |
| Fairfield,Ala. T2 | 6.775 |
| Gary,Ind. U5 | 6.775 |
| Ind.Harbor,Ind. I-2, Y1 | 6.775 |
| Irvin,Pa. U5 | 6.775 |
| Middletown,O. A10 | 6.775 |
| Niles,O. M21, S3 | 6.775 |
| Youngstown Y1 | 6.775 |

### BLUED STOCK, 29 Gage

| | |
|---|---|
| Dover,O. E6 | 8.70 |
| Follansbee,W.Va. F4 | 8.70 |
| Ind.Harbor,Ind. I-2 | 8.70 |
| Mansfield,O. E6 | 8.70 |
| Warren,O. R2 | 8.70 |
| Yorkville,O. W10 | 8.70 |

### SHEETS, Long Terne, Steel (Commercial Quality)

| | |
|---|---|
| BeechBottom,W.Va.W10 | 7.225 |
| Gary,Ind. U5 | 7.225 |
| Mansfield,O. E6 | 7.225 |
| Middletown,O. A10 | 7.225 |
| Niles,O. M21, S3 | 7.225 |
| Warren,O. R2 | 7.225 |
| Weirton,W.Va. W6 | 7.225 |

### SHEETS, Long Terne, Ingot Iron

| | |
|---|---|
| Middletown,O. A10 | 7.625 |

## Key To Producers

| | |
|---|---|
| A1 | Acme Steel Co. |
| A2 | Acme-Newport Steel Co. |
| A3 | Alan Wood Steel Co. |
| A4 | Allegheny Ludlum Steel |
| A5 | Alloy Metal Wire Div., H. K. Porter Co. Inc. |
| A6 | American Shim Steel Co. |
| A7 | American Steel & Wire Div., U.S. Steel Corp. |
| A8 | Anchor Drawn Steel Co. |
| A9 | Angell Nail & Chaplet |
| A10 | Armco Steel Corp. |
| A11 | Atlantic Steel Co. |
| A24 | Alaska Steel Mills Inc. |
| B1 | Babcock & Wilcox |
| B2 | Bethlehem Steel Co. |
| B3 | Bethlehem Steel Co., Pacific Coast Div. |
| B4 | Blair Strip Steel Co. |
| B5 | Bliss & Laughlin Inc. |
| B8 | Braeburn Alloy Steel |
| B9 | Brainard Steel Div., Sharon Steel Corp. |
| B10 | E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron |
| B12 | Buffalo Steel Corp. |
| B14 | A. M. Byers Co. |
| B15 | J. Bishop & Co. |
| C1 | Calstrip Steel Corp. |
| C2 | Calumet Steel Div., Borg-Warner Corp. |
| C4 | Carpenter Steel Co. |
| C9 | Colonial Steel Co. |
| C10 | Colorado Fuel & Iron |
| C11 | Columbia-Geneva Steel |
| C12 | Columbia Steel & Shaft. |
| C13 | Columbia Tool Steel Co. |
| C14 | Compressed Steel Shaft. |
| C15 | Connors Steel Div., H. K. Porter Co., Inc. |
| C16 | Continental Steel Corp. |
| C17 | Copperweld Steel Co. |
| C18 | Crucible Steel Co. |
| C19 | Cumberland Steel Co. |
| C20 | Cuyahoga Steel & Wire |
| C22 | Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron |
| C23 | Charter Wire Inc. |
| C24 | G. O. Carlson Inc. |
| C32 | Carpenter Steel of N.Eng. |
| D2 | Detroit Steel Corp. |
| D4 | Disston Div., H. K. Porter Co. Inc. |
| D6 | Driver-Harris Co. |
| D7 | Dickson Weatherproof Nail Co. |
| D8 | Damascus Tube Co. |
| D9 | Wilbur B. Driver Co. |
| E1 | Eastern Gas&Fuel Assoc. |
| E2 | Eastern Stainless Steel |
| E5 | Elliott Bros. Steel Co. |
| E6 | Empire-Reeves Steel |
| E10 | Enamel Prod. & Plating |
| F2 | Firth Sterling Inc. |
| F3 | Fitzsimmons Steel Co. |
| F4 | Follansbee Steel Corp. |
| F5 | Franklin Steel Div., Borg-Warner Corp. |
| F6 | Fretz-Moon Tube Co. |
| F7 | Ft. Howard Steel & Wire |
| F8 | Ft. Wayne Metals Inc. |
| G4 | Granite City Steel Co. |
| G5 | Great Lakes Steel Corp. |
| G6 | Greer Steel Co. |
| G8 | Green River Steel Corp. |
| H1 | Hanna Furnace Corp. |
| H7 | Helical Tube Co. |
| I-1 | Igoe Bros. Inc. |
| I-2 | Inland Steel Co. |
| I-3 | Interlake Iron Corp. |
| I-4 | Ingersoll Steel Div., Borg-Warner Corp. |
| I-6 | Ivins Steel Tube Works |
| I-7 | Indiana Steel & Wire Co. |
| J1 | Jackson Iron & Steel Co. |
| J3 | Jessop Steel Co. |
| J4 | Johnson Steel & Wire Co. |
| J5 | Jones & Laughlin Steel |
| J6 | Joslyn Mfg. & Supply |
| J7 | Judson Steel Corp. |
| J8 | Jersey Shore Steel Co. |
| K1 | Kaiser Steel Corp. |
| K2 | Keokuk Electro-Metals |
| K3 | Keystone Drawn Steel |
| K4 | Keystone Steel & Wire |
| K7 | Kenmore Metals Corp. |
| L1 | Laclede Steel Co. |
| L2 | LaSalle Steel Co. |
| L3 | Latrobe Steel Co. |
| L6 | Lone Star Steel Co. |
| L7 | Lukens Steel Co. |
| L8 | Leschen Wire Rope Div., H. K. Porter Co. Inc. |
| M1 | McLouth Steel Corp. |
| M4 | Mahoning Valley Steel |
| M6 | Mercer Pipe Div., Sawhill Tubular Products |
| M8 | Mid-States Steel & Wire |
| M12 | Moltrup Steel Products |
| M14 | McInnes Steel Co. |
| M16 | Md. Fine & Specialty Wire Co. Inc. |
| M17 | Metal Forming Corp. |
| M18 | Milton Steel Div. Merritt-Chapman&Scott |
| M21 | Mallory-Sharon Metals Corp. |
| M22 | Mill Strip Products Co. |
| N1 | National-Standard Co. |
| N2 | National Supply Co. |
| N3 | National Tube Div., U. S. Steel Corp. |
| N5 | Nelsen Steel & Wire Co. |
| N6 | New England High Carbon Wire Co. |
| N8 | Newman-Crosby Steel |
| N14 | Northwest. Steel Rolling Mills Inc. |
| N15 | Northwestern S.&W. Co. |
| N20 | Neville Ferro Alloy Co. |
| O4 | Oregon Steel Mills |
| P1 | Pacific States Steel Corp. |
| P2 | Pacific Tube Co. |
| P4 | Phoenix Steel Corp. |
| P5 | Pilgrim Drawn Steel |
| P6 | Pittsburgh Coke&Chem. |
| P7 | Pittsburgh Steel Co. |
| P11 | Pollak Steel Co. |
| P12 | Portsmouth Div., Detroit Steel Corp. |
| P13 | Precision Drawn Steel |
| P15 | Pittsburgh Metallurgical |
| P16 | Page Steel & Wire Div., American Chain & Cable |
| P17 | Plymouth Steel Corp. |
| P19 | Pitts. Rolling Mills |
| P20 | Prod. Steel Strip Corp. |
| P22 | Phoenix Mfg. Co. |
| P24 | Phil. Steel & Wire Corp. |
| R2 | Republic Steel Corp. |
| R3 | Rhode Island Steel Corp. |
| R5 | Roebling's Sons, John A. |
| R6 | Rome Strip Steel Co. |
| R8 | Reliance Div.,EatonMfg. |
| R9 | Rome Mfg. Co. |
| R10 | Rodney Metals Inc. |
| S1 | Seneca Wire & Mfg. Co. |
| S3 | Sharon Steel Corp. |
| S4 | Sharon Tube Co. |
| S5 | Sheffield Div., Armco Steel Corp. |
| S6 | Shenango Furnace Co. |
| S7 | Simmons Co. |
| S8 | Simonds Saw & Steel Co. |
| S12 | Spencer Wire Corp. |
| S13 | Standard Forgings Corp. |
| S14 | Standard Tube Co. |
| S15 | Stanley Works |
| S17 | Superior Drawn Steel Co. |
| S18 | Superior Steel Div., Copperweld Steel Co. |
| S19 | Sweet's Steel Co. |
| S20 | Southern States Steel |
| S23 | Superior Tube Co. |
| S25 | Stainless Welded Prod. |
| S26 | Specialty Wire Co. Inc. |
| S30 | Sierra Drawn Steel Corp. |
| S40 | Seneca Steel Service |
| S41 | Stainless & Strip Div., J&L Steel Corp. |
| S42 | Southern Elec. Steel Co. |
| S43 | Seymour Mfg. Co. |
| S44 | Screw & Bolt Corp. of America |
| T2 | Tenn. Coal & Iron |
| T3 | Tenn. Products & Chemical Corp. |
| T4 | Texas Steel Co. |
| T5 | Thomas Strip Div., Pittsburgh Steel Co. |
| T6 | Thompson Wire Co. |
| T7 | Timken Roller Bearing |
| T9 | Tonawanda Iron Div., Am. Rad. & Stan. San. |
| T13 | Tube Methods Inc. |
| T19 | Techalloy Co. Inc. |
| U3 | Union Wire Rope Corp. |
| U4 | Universal-Cyclops Steel |
| U5 | United States Steel Corp. |
| U6 | U. S. Pipe & Foundry |
| U7 | Ulbrich Stainless Steels |
| U8 | U. S. Steel Supply Div., U. S. Steel Corp. |
| U11 | Union Carbide Metals Co. |
| U13 | Union Steel Corp. |
| V2 | Vanadium-Alloys Steel |
| V3 | Vulcan-Kidd Steel Div., H. K. Porter Co. |
| W1 | Wallace Barnes Steel Div., Associated Spring |
| W2 | Wallingford Steel Co. |
| W3 | Washburn Wire Co. |
| W4 | Washington Steel Corp. |
| W6 | Weirton Steel Co. |
| W8 | Western Automatic Machine Screw Co. |
| W9 | Wheatland Tube Co. |
| W10 | Wheeling Steel Corp. |
| W12 | Wickwire Spencer Steel Div., Colo. Fuel & Iron |
| W13 | Wilson Steel & Wire Co. |
| W14 | Wisconsin Steel Div., International Harvester |
| W15 | Woodward Iron Co. |
| W18 | Wyckoff Steel Co. |
| Y1 | Youngstown Sheet&Tube |

# STRIP

**STRIP, Hot-Rolled Carbon**

| | |
|---|---|
| Ala.City,Ala.(27) R2 | 5.10 |
| Allenport,Pa. P7 | 5.10 |
| Alton,Ill. L1 | 5.30 |
| Ashland,Ky.(8) A10 | 5.10 |
| Atlanta A11 | 5.10 |
| Bessemer,Ala. T2 | 5.10 |
| Birmingham C15 | 5.10 |
| Conshohocken,Pa. A3 | 5.15 |
| Detroit M1 | 5.10 |
| Ecorse,Mich. G5 | 5.10 |
| Fairfield,Ala. T2 | 5.10 |
| Farrell,Pa. S3 | 5.10 |
| Fontana,Calif. K1 | 5.825 |
| Gary,Ind. U5 | 5.10 |
| Ind.Harbor,Ind. I-2, Y1 | 5.10 |
| Johnstown,Pa.(25) B2 | 5.10 |
| Lackaw'na,N.Y.(25) B2 | 5.10 |
| LosAngeles(25) B3 | 5.85 |
| LosAngeles C1 | 8.60 |
| Minnequa,Colo. C10 | 6.20 |
| Riverdale,Ill. A1 | 5.10 |
| San Francisco S7 | 6.60 |
| Seattle(25) B3 | 6.10 |
| Seattle N14 | 6.60 |
| Sharon,Pa. S3 | 5.10 |
| S.Chicago,Ill. W14 | 5.10 |
| S.SanFrancisco(25) B3 | 5.85 |
| SparrowsPoint,Md. B2 | 5.10 |
| Torrance,Calif. C11 | 5.85 |
| Warren,O. R2 | 5.10 |
| Weirton,W.Va. W6 | 5.10 |
| Youngstown U5 | 5.10 |

**STRIP, Hot-Rolled Alloy**

| | |
|---|---|
| Carnegie,Pa. S18 | 8.40 |
| Farrell,Pa. S3 | 8.40 |
| Gary,Ind. U5 | 8.40 |
| Houston S5 | 8.65 |
| Ind.Harbor,Ind. Y1 | 8.40 |
| KansasCity,Mo. S5 | 8.65 |
| LosAngeles B3 | 9.60 |
| Lowellville,O. S3 | 8.40 |
| Newport,Ky. A2 | 8.40 |
| Sharon,Pa. A2, S3 | 8.40 |
| S.Chicago,Ill. W14 | 8.40 |
| Youngstown U5, Y1 | 8.40 |

**STRIP, Hot-Rolled High-Strength, Low-Alloy**

| | |
|---|---|
| Ashland,Ky., A10 | 7.575 |
| Bessemer,Ala. T2 | 7.575 |
| Conshohocken,Pa. A3 | 7.575 |
| Ecorse,Mich. G5 | 7.575 |
| Fairfield,Ala. T2 | 7.575 |
| Farrell,Pa. S3 | 7.575 |
| Gary,Ind. U5 | 7.575 |
| Ind.Harbor,Ind. I-2, Y1 | 7.575 |
| Lackawanna,N.Y. B2 | 7.575 |
| LosAngeles(25) B3 | 8.325 |
| Seattle(25) B3 | 8.575 |
| Sharon,Pa. S3 | 7.575 |
| S.Chicago,Ill. W14 | 7.575 |
| S.SanFrancisco(25) B3 | 8.325 |
| SparrowsPoint,Md. B2 | 7.575 |
| Warren,O. R2 | 7.575 |
| Weirton,W.Va. W6 | 7.575 |
| Youngstown U5, Y1 | 7.575 |

**STRIP, Hot-Rolled Ingot Iron**

| | |
|---|---|
| Ashland,Ky.(8) A10 | 5.35 |
| Warren,O. R2 | 5.875 |

**STRIP, Cold-Rolled Carbon**

| | |
|---|---|
| Anderson,Ind. G6 | 7.425 |
| Baltimore T6 | 7.425 |
| Boston T6 | 7.975 |
| Buffalo S40 | 7.425 |
| Cleveland A7, J5 | 7.425 |
| Dearborn,Mich. S3 | 7.425 |
| Detroit D2, M1, P20 | 7.425 |
| Dover,O. G6 | 7.425 |
| Evanston,Ill. M22 | 7.525 |
| Farrell,Pa. S3 | 7.425 |
| Follansbee,W.Va. W10 | 7.425 |
| Fontana,Calif. K1 | 9.20 |
| FranklinPark,Ill. T6 | 7.525 |
| Ind.Harbor,Ind. Y1 | 7.425 |
| Indianapolis S41 | 7.575 |
| LosAngeles C1, S41 | 9.30 |
| McKeesport,Pa. E10 | 7.525 |
| NewBedford,Mass. R10 | 7.875 |
| NewBritain,Conn. S15 | 7.875 |
| NewCastle,Pa. B4, E5 | 7.425 |
| NewHaven,Conn. D2 | 7.875 |
| NewKensington,Pa. A6 | 7.425 |
| Pawtucket,R.I. R3 | 7.975 |
| Pawtucket,R.I. N8 | 7.975 |
| Philadelphia P24 | 7.875 |
| Pittsburgh J5 | 7.425 |
| Riverdale,Ill. A1 | 7.525 |
| Rome,N.Y.(32) R6 | 7.425 |
| Sharon,Pa. S3 | 7.425 |
| Trenton,N.J.(31) R5 | 8.875 |
| Wallingford,Conn. W2 | 7.875 |
| Warren,O. R2, T5 | 7.425 |
| Worcester,Mass. A7 | 7.975 |

**STRIP, Cold-Rolled Alloy**

| | |
|---|---|
| Boston T6 | 15.90 |
| Carnegie,Pa. S18 | 15.55 |
| Cleveland A7 | 15.55 |
| Dover,O. G6 | 15.55 |
| Farrell,Pa. S3 | 15.55 |
| FranklinPark,Ill. T6 | 15.55 |
| Harrison,N.J. S18 | 15.55 |
| Indianapolis S41 | 15.70 |
| LosAngeles S41 | 17.75 |
| Lowellville,O. S3 | 15.55 |
| Pawtucket,R.I. N8 | 15.90 |
| Riverdale,Ill. A1 | 15.55 |
| Sharon,Pa. S3 | 15.55 |
| Worcester,Mass. A7 | 15.85 |
| Youngstown S41 | 15.55 |

**STRIP, Cold-Rolled High-Strength, Low-Alloy**

| | |
|---|---|
| Cleveland A7 | 10.80 |
| Dearborn,Mich. S3 | 10.80 |
| Dover,O. G6 | 10.80 |
| Farrell,Pa. S3 | 10.80 |
| Ind.Harbor,Ind. Y1 | 10.80 |
| Sharon,Pa. S3 | 10.80 |
| Warren,O. R2 | 10.80 |
| Weirton,W.Va. W6 | 10.80 |
| Youngstown Y1 | 10.80 |

**STRIP, Cold-Rolled Ingot Iron**

| | |
|---|---|
| Warren,O. R2 | 8.175 |

**STRIP, C.R. Electrogalvanized**

| | |
|---|---|
| Cleveland A7 | 7.425* |
| Dover,O. G6 | 7.425* |
| Evanston,Ill. M22 | 7.525* |
| McKeesport,Pa. E10 | 7.50* |
| Riverdale,Ill. A1 | 7.525* |
| Warren,O. B9, S3, T5 | 7.425* |
| Worcester,Mass. A7 | 7.975 |
| Youngstown S41, Y1 | 7.425* |

*Plus galvanizing extras.

**STRIP, Galvanized (Continuous)**

| | |
|---|---|
| Farrell,Pa. S3 | 7.50 |
| Sharon,Pa. S3 | 7.50 |

**TIGHT COOPERAGE HOOP**

| | |
|---|---|
| Atlanta A11 | 5.65 |
| Farrell,Pa. S3 | 5.525 |
| Riverdale,Ill. A1 | 5.675 |
| Sharon,Pa. S3 | 5.525 |
| Youngstown U5 | 5.525 |

| STRIP, Cold-Finished Spring Steel (Annealed) | 0.26-0.40C | 0.41-0.60C | 0.61-0.80C | 0.81-1.05C | 1.06-1.35C |
|---|---|---|---|---|---|
| Baltimore T6 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Boston T6 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Bristol,Conn. W1 | .... | 10.70 | 12.90 | 16.10 | 19.30 |
| Carnegie,Pa. S18 | 8.95 | 10.40 | 12.60 | 15.60 | .... |
| Cleveland A7 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Dearborn,Mich. S3 | 9.05 | 10.50 | 12.70 | .... | .... |
| Detroit D2 | 9.05 | 10.50 | 12.70 | 15.70 | .... |
| Dover,O. G6 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Evanston,Ill. M22 | 8.95 | 10.40 | 12.60 | 15.60 | .... |
| Farrell,Pa. S3 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Fostoria,O. S1 | 10.05 | 10.40 | 12.60 | 15.60 | .... |
| FranklinPark,Ill. T6 | 9.05 | 10.40 | 12.60 | 15.60 | 18.55 |
| Harrison,N.J. C18 | .... | .... | 12.90 | 16.10 | 19.30 |
| Indianapolis S41 | 9.10 | 10.55 | 12.60 | 15.60 | 18.55 |
| LosAngeles C1 | 11.15 | 12.60 | 14.80 | 17.80 | .... |
| LosAngeles S41 | 11.15 | 12.60 | 14.80 | .... | .... |
| NewBritain,Conn. S15 | 9.40 | 10.70 | 12.90 | 15.90 | 18.85 |
| NewCastle,Pa. B4, E5 | 8.95 | 10.40 | 12.60 | 15.60 | .... |
| NewHaven,Conn. D2 | 9.40 | 10.70 | 12.90 | 15.90 | .... |
| NewKensington,Pa. A6 | 9.85 | 10.40 | 12.60 | 15.60 | .... |
| NewYork W3 | .... | 10.70 | 12.90 | 16.10 | 19.30 |
| Pawtucket,R.I. N8 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Riverdale,Ill. A1 | 9.05 | 10.40 | 12.60 | 15.60 | 18.55 |
| Rome,N.Y. R6 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Sharon,Pa. S3 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Trenton,N.J. R5 | .... | 10.70 | 12.90 | 15.90 | 18.85 |
| Wallingford,Conn. W2 | 9.40 | 10.70 | 12.90 | 15.90 | 18.75 |
| Warren,O. T5 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Worcester,Mass. A7, T6 | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Youngstown S41 | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |

| Spring Steel (Tempered) | | | 0.80C | 1.05C | 1.35C |
|---|---|---|---|---|---|
| Bristol,Conn. W1 | ... | ... | 18.85 | 22.95 | 27.80 |
| Buffalo W12 | ... | ... | 18.85 | .... | .... |
| Fostoria,O. S1 | ... | ... | 19.05 | 22.15 | .... |
| FranklinPark,Ill. T6 | ... | ... | 19.20 | 23.30 | 28.15 |
| Harrison,N.J. C18 | ... | ... | 18.85 | 22.95 | 27.80 |
| NewYork W3 | ... | ... | 18.85 | 22.95 | 27.80 |
| Palmer,Mass. W12 | ... | ... | 18.85 | .... | .... |
| Trenton,N.J. R5 | ... | ... | 18.85 | 22.95 | 27.80 |
| Worcester,Mass. A7, T6 | ... | ... | 18.85 | 22.95 | 27.80 |
| Youngstown S41 | ... | ... | 19.20 | 23.30 | 28.15 |

# TIN MILL PRODUCTS

| TIN PLATE, Electrolytic (Base Box) | 0.25 lb | 0.50 lb | 0.75 lb |
|---|---|---|---|
| Aliquippa,Pa. J5 | $9.10 | $9.35 | $9.75 |
| Fairfield,Ala. T2 | 9.20 | 9.45 | 9.85 |
| Fairless,Pa. U5 | 9.20 | 9.45 | 9.85 |
| Fontana,Calif. K1 | 9.75 | 10.00 | 10.40 |
| Gary,Ind. U5 | 9.10 | 9.35 | 9.75 |
| GraniteCity,Ill. G4 | 9.20 | 9.45 | 9.60 |
| IndianaHarbor,Ind. I-2, Y1 | 9.10 | 9.35 | 9.75 |
| Irvin,Pa. U5 | 9.10 | 9.35 | 9.75 |
| Niles,O. R2 | 9.10 | 9.35 | 9.75 |
| Pittsburg,Calif. C11 | 9.75 | 10.00 | 10.40 |
| SparrowsPoint,Md. B2 | 9.10 | 9.35 | 9.75 |
| Weirton,W.Va. W6 | 9.10 | 9.35 | 9.75 |
| Yorkville,O. W10 | 9.10 | 9.35 | 9.75 |

| ELECTROLYTIC TIN-COATED SHEET (Dollars per 100 lb) | | | |
|---|---|---|---|
| Aliquippa,Pa. J5 (21-27 Ga.) | 7.90 | 8.10 | .... |
| IndianaHarbor,Ind. Y1 (20-27 Ga.) | 7.90 | .... | .... |
| Niles,O. R2 (20-27 Ga.) | 7.90 | 8.10 | 8.30 |

| TIN PLATE, Hot Dipped Common Coke | 1.25 lb | 1.50 lb |
|---|---|---|
| Aliquippa,Pa. J5 | $10.40 | $10.65 |
| Fairfield,Ala. T2 | 10.50 | 10.75 |
| Fontana,Calif. K1 | 11.05 | 11.30 |
| Gary,Ind. U5 | 10.40 | 10.65 |
| Ind.Harb. Y1 | 10.40 | 10.65 |
| Irvin,Pa. U5 | 10.40 | 10.65 |
| Pitts.,Calif. C11 | 11.05 | 11.30 |
| Sp.Pt.,Md. B2 | 10.40 | 10.65 |
| Weirton,W.Va. W6 | 10.40 | 10.65 |
| Yorkville,O. W10 | 10.40 | 10.65 |

**BLACK PLATE (Base Box)**

| | |
|---|---|
| Aliquippa,Pa. J5 | $8.20 |
| Fairfield,Ala. T2 | 8.30 |
| Fairless,Pa. U5 | 8.30 |
| Fontana,Calif. K1 | 8.85 |
| Gary,Ind. U5 | 8.20 |
| GraniteCity,Ill. G4 | 8.30 |
| Ind.Harbor,Ind. I-2, Y1 | 8.20 |
| Irvin,Pa. U5 | 8.20 |
| Niles,O. R2 | 8.20 |
| Pittsburg,Calif. C11 | 8.85 |
| SparrowsPoint,Md. B2 | 8.20 |
| Weirton,W.Va. W6 | 8.20 |
| Yorkville,O. W10 | 8.20 |

**HOLLOWARE ENAMELING Black Plate (29 Gage)**

| | |
|---|---|
| Aliquippa,Pa. J5 | 7.85 |
| Gary,Ind. U5 | 7.85 |
| GraniteCity,Ill. G4 | 7.95 |
| Ind.Harbor,Ind. Y1 | 7.85 |
| Irvin,Pa. U5 | 7.85 |
| Yorkville,O. W10 | 7.85 |

**MANUFACTURING TERNES (Special Coated, Base Box)**

| | |
|---|---|
| Gary,Ind. U5 | $10.05 |
| Irvin,Pa. U5 | 10.05 |

# SILICON STEEL

| C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower) | Field | Armature | Electric | Motor | Dynamo |
|---|---|---|---|---|---|
| BeechBottom,W.Va. W10 | .... | 11.70 | 12.40 | 13.35 | 14.65 |
| Brackenridge,Pa. A4 | .... | .... | 12.40 | 13.55 | 14.65 |
| GraniteCity,Ill. G4 | 9.975* | 11.30* | 12.00* | 13.15* | .... |
| IndianaHarbor,Ind. I-2 | 9.875* | 11.20* | 11.90* | 13.05* | .... |
| Mansfield,O. E6 | 9.875* | 11.70 | 12.40 | 13.55 | 14.65 |
| Newport,Ky. A2 | 9.875 | 11.70* | 12.40* | 13.55* | 14.65* |
| Niles,O. M21 | 9.875* | 11.70 | 12.40 | 13.55 | .... |
| Vandergrift,Pa. U5 | 9.875* | 11.70 | 12.40 | 13.55 | 14.65 |
| Warren,O. R2 | 9.875* | 11.70 | 12.40 | 13.55 | 14.65 |
| Zanesville,O. A10 | .... | 11.70† | 12.40 | 13.55 | 14.65 |

| | |
|---|---|
| Vandergrift,Pa. U5 | 8.10 |
| Mansfield,O. E6 | 8.10 |
| Warren,O. R2 (Silicon Lowcore) | 8.10 |

| SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower) | T-72 | T-65 | T-58 | T-52 |
|---|---|---|---|---|
| BeechBottom,W.Va. W10 | 15.70 | 16.30 | 16.80 | 17.85 |
| Vandergrift,Pa. U5 | 15.70 | 16.30 | 16.80 | 17.85 |
| Zanesville,O. A10 | 15.70 | 16.30 | 16.80 | 17.85 |

| C.R. COILS & CUT LENGTHS (22 Ga.) | Grain Oriented | | | | | |
|---|---|---|---|---|---|---|
| | T-100 | T-90 | T-80 | T-73 | T-66 | T-72 |
| Brackenridge,Pa. A4 | .... | 18.10 | 19.70 | 20.20 | 20.70 | 15.70†† |
| Butler,Pa. A10 | .... | .... | 19.70 | 20.20 | 20.70 | .... |
| Vandergrift,Pa. U5 | 17.10 | 18.10 | 19.70 | 20.20 | 20.70 | 15.70 |
| Warren,O. R2 | .... | .... | .... | .... | .... | 15.70‡ |

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

# WIRE

**WIRE, Manufacturers Bright, Low Carbon**

| | |
|---|---|
| AlabamaCity,Ala. R2 | 8.00 |
| Aliquippa,Pa. J5 | 8.00 |
| Alton,Ill. L1 | 8.20 |
| Atlanta A1 | 8.00 |
| Bartonville,Ill. K4 | 8.10 |
| Buffalo W12 | 8.00 |
| Chicago W13 | 8.00 |
| Cleveland A7, C20 | 8.00 |
| Crawfordsville,Ind. M8 | 8.10 |
| Donora,Pa. A7 | 8.00 |
| Duluth A7 | 8.00 |
| Fairfield,Ala. T2 | 8.00 |
| Fostoria,O.(24) S1 | 8.10 |
| Houston S5 | 8.25 |
| Jacksonville,Fla. M8 | 8.35 |
| Johnstown,Pa. B2 | 8.00 |
| Joliet,Ill. A7 | 8.00 |
| KansasCity,Mo. S5 | 8.25 |
| Kokomo,Ind. C16 | 8.10 |
| LosAngeles B3 | 8.95 |
| Minnequa,Colo. C10 | 8.25 |
| Monessen,Pa. P7, P16 | 8.00 |
| Palmer,Mass. W12 | 8.30 |
| Pittsburg,Calif. C11 | 8.95 |
| Portsmouth,O. P12 | 8.00 |
| Rankin,Pa. A7 | 8.00 |
| S.Chicago,Ill. R2 | 8.00 |
| S.SanFrancisco C10 | 8.95 |
| SparrowsPoint,Md. B2 | 8.10 |
| Sterling,Ill.(1) N15 | 8.00 |
| Sterling,Ill. N15 | 8.10 |
| Struthers,O. Y1 | 8.00 |
| Waukegan,Ill. A7 | 8.00 |
| Worcester,Mass. A7 | 8.30 |

**WIRE, Cold Heading Carbon**

| | |
|---|---|
| Elyria,O. W8 | 8.00 |

**WIRE, Gal'd., for ACSR**

| | |
|---|---|
| Bartonville,Ill. K4 | 12.65 |
| Buffalo W12 | 13.40 |
| Cleveland A7 | 12.65 |
| Donora,Pa. A7 | 12.65 |
| Duluth A7 | 12.65 |
| Johnstown,Pa. B2 | 13.40 |
| KansasCity,Mo. U3 | 12.90 |
| Minnequa,Colo. C10 | 12.775 |
| Monessen,Pa. P7, P16 | 12.65 |
| Muncie,Ind. I-7 | 13.60 |
| NewHaven,Conn. A7 | 12.95 |
| Palmer,Mass. W12 | 13.70 |
| Pittsburg,Calif. C11 | 13.45 |
| Portsmouth,O. P12 | 12.65 |
| Roebling,N.J. R5 | 12.95 |
| SparrowsPt.,Md. B2 | 13.50 |
| Struthers,O. Y1 | 13.40 |
| Trenton,N.J. A7 | 12.95 |
| Waukegan,Ill. A7 | 12.65 |
| Worcester,Mass. A7 | 12.95 |

**WIRE, Upholstery Spring**

| | |
|---|---|
| Aliquippa,Pa. J5 | 9.75 |
| Alton,Ill. L1 | 9.95 |
| Buffalo W12 | 9.75 |
| Cleveland A7 | 9.75 |
| Donora,Pa. A7 | 9.75 |
| Duluth A7 | 9.75 |
| Johnstown,Pa. B2 | 9.75 |
| KansasCity,Mo. S5, U3 | 10.00 |
| LosAngeles B3 | 10.70 |
| Minnequa,Colo. C10 | 9.95 |
| Monessen,Pa. P7, P16 | 9.75 |
| NewHaven,Conn. A7 | 10.05 |
| Palmer,Mass. W12 | 10.05 |
| Pittsburg,Calif. C11 | 10.70 |
| Portsmouth,O. P12 | 9.75 |
| Roebling,N.J. R5 | 10.05 |
| S.Chicago,Ill. R2 | 9.75 |
| S.SanFrancisco C10 | 10.70 |
| SparrowsPt.,Md. B2 | 9.85 |
| Struthers,O. Y1 | 9.75 |
| Trenton,N.J. A7 | 10.05 |
| Waukegan,Ill. A7 | 9.75 |
| Worcester,Mass. A7 | 10.05 |

**WIRE, MB Spring, High-Carbon**

| | |
|---|---|
| Aliquippa,Pa. J5 | 9.75 |
| Alton,Ill. L1 | 9.95 |
| Bartonville,Ill. K4 | 9.85 |
| Buffalo W12 | 9.75 |
| Cleveland A7 | 9.75 |
| Donora,Pa. A7 | 9.75 |
| Duluth A7 | 9.75 |
| Fostoria,O. S1 | 9.80 |
| Johnstown,Pa. B2 | 9.75 |
| KansasCity,Mo. S5, U3 | 10.00 |
| LosAngeles B3 | 10.70 |
| Milbury,Mass.(12) N6 | 10.05 |
| Minnequa,Colo. C10 | 9.95 |
| Monessen,Pa. P7, P16 | 9.75 |
| Muncie,Ind. I-7 | 9.95 |
| Palmer,Mass. W12 | 10.05 |
| Pittsburg,Calif. C11 | 10.70 |
| Portsmouth,O. P12 | 9.75 |
| Roebling,N.J. R5 | 10.05 |
| S.Chicago,Ill. R2 | 9.75 |
| S.SanFrancisco C10 | 10.70 |
| SparrowsPt.,Md. B2 | 9.85 |
| Struthers,O. Y1 | 9.75 |
| Trenton,N.J. A7 | 10.05 |
| Waukegan,Ill. A7 | 9.75 |
| Wor'ster,Mass. A7,J4,T6 | 10.05 |

**WIRE, Fine & Weaving (8" Coils)**

| | |
|---|---|
| Alton,Ill. L1 | 16.50 |
| Bartonville,Ill. K4 | 16.40 |
| Chicago W13 | 16.30 |
| Cleveland A7 | 16.30 |
| Crawfordsville,Ind. M8 | 16.40 |
| Fostoria,O. S1 | 16.30 |
| Houston S5 | 16.55 |
| Jacksonville,Fla. M8 | 16.65 |
| Johnstown,Pa. B2 | 16.30 |
| KansasCity,Mo. S5 | 16.55 |
| Kokomo,Ind. C16 | 16.30 |
| Minnequa,Colo. C16 | 16.55 |
| Monessen,Pa. P16 | 16.55 |
| Muncie,Ind. I-7 | 16.50 |
| Palmer,Mass. W12 | 16.60 |
| S.SanFrancisco C10 | 17.15 |
| Waukegan,Ill. A7 | 16.30 |
| Worcester,Mass. A7,J6 | 16.60 |

**WIRE, Tire Bead**

| | |
|---|---|
| Bartonville,Ill. K4 | 17.15 |
| Monessen,Pa. P16 | 17.15 |
| Roebling,N.J. R5 | 17.65 |

| ROPE WIRE | (A) |
|---|---|
| Bartonville,Ill. K4 | 13.45 |
| Buffalo W12 | 13.45 |
| Fostoria,O. S1 | 13.45 |
| KansasCity,Mo. U3 | 13.70 |
| Johnstown,Pa. B2 | 13.45 |
| Monessen,Pa. P7 | 13.45 |
| Muncie,Ind. I-7 | 13.65 |
| Palmer,Mass. W12 | 13.75 |
| Portsmouth,O. P12 | 13.45 |
| Roebling,N.J. R5 | 13.45 |
| St.Louis L8 | 13.45 |
| SparrowsPt.,Md. B2 | 13.55 |
| Struthers,O. Y1 | 13.45 |
| Worcester,Mass. J4 | 13.75 |

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

| Wire, Cold-Rolled Flat | |
|---|---|
| Anderson,Ind. G6 | 12.35 |
| Baltimore T6 | 12.65 |
| Boston T6 | 12.65 |
| Buffalo W12 | 12.35 |
| Chicago W13 | 12.45 |
| Cleveland A7 | 12.35 |
| Crawfordsville,Ind. M8 | 12.35 |
| Dover,O. G6 | 12.35 |
| Farrell,Pa. S3 | 12.35 |
| Fostoria,O. S1 | 12.35 |
| FranklinPark,Ill. T6 | 12.45 |
| Kokomo,Ind. C16 | 12.35 |
| Massillon,O. R8 | 12.35 |
| Milwaukee C23 | 12.55 |
| Monessen,Pa. P7, P16 | 12.35 |
| Palmer,Mass. W12 | 12.65 |
| Pawtucket,R.I. N8 | 12.65 |
| Philadelphia P24 | 12.65 |
| Riverdale,Ill. A1 | 12.45 |
| Rome,N.Y. R6 | 12.35 |
| Sharon,Pa. S3 | 12.35 |
| Trenton,N.J. R5 | 12.65 |
| Warren,O. B9 | 12.35 |
| Worcester,Mass. A7,T6 | 12.65 |

| NAILS, Stock | Col. |
|---|---|
| AlabamaCity,Ala. R2 | 173 |
| Aliquippa,Pa. J5 | 173 |
| Atlanta A11 | 175 |
| Bartonville,Ill. K4 | 175 |
| Chicago W13 | 173 |
| Cleveland A9 | 173 |
| Crawfordsville,Ind. M8 | 175 |
| Donora,Pa. A7 | 173 |
| Duluth A7 | 173 |
| Fairfield,Ala. T2 | 173 |
| Houston S5 | 178 |
| Jacksonville,Fla. M8 | 175 |
| Johnstown,Pa. B2 | 173 |
| Joliet,Ill. A7 | 173 |
| KansasCity,Mo. S5 | 178 |
| Kokomo,Ind. C16 | 175 |
| Minnequa,Colo. C10 | 178 |
| Monessen,Pa. P7 | 173 |
| Pittsburg,Calif. C11 | 192 |
| Rankin,Pa. A7 | 173 |
| S.Chicago,Ill. R2 | 173 |
| SparrowsPt., Md. B2 | 175 |
| Sterling,Ill.(7) N15 | 175 |
| Worcester,Mass. A7 | 179 |

| (To Wholesalers: per cwt) | |
|---|---|
| Galveston,Tex. D7 | $10.30 |

| NAILS, Cut (100 lb kegs) | |
|---|---|
| Wheeling,W.Va. W10 | $10.10 |

| POLISHED STAPLES | Col. |
|---|---|
| AlabamaCity,Ala. R2 | 175 |
| Aliquippa,Pa. J5 | 173 |
| Atlanta A11 | 177 |
| Bartonville,Ill. K4 | 175 |
| Crawfordsville,Ind. M8 | 177 |
| Donora,Pa. A7 | 173 |
| Duluth A7 | 173 |
| Fairfield,Ala. T2 | 173 |
| Houston S5 | 180 |
| Jacksonville,Fla. M8 | 177 |
| Johnstown,Pa. B2 | 175 |
| Joliet,Ill. A7 | 173 |
| KansasCity,Mo. S5 | 180 |
| Kokomo,Ind. C16 | 177 |
| Minnequa,Colo. C10 | 178 |
| Pittsburg,Calif. C11 | 194 |
| Rankin,Pa. A7 | 173 |
| S.Chicago,Ill. R2 | 175 |
| SparrowsPt.,Md. B2 | 177 |
| Sterling Ill.(7) N15 | 175 |
| Worcester,Mass. A7 | 181 |

**TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box)**

| Coil No. 3150 | |
|---|---|
| AlabamaCity,Ala. R2 | $9.24 |
| Atlanta A11 | 10.36 |
| Bartonville,Ill. K4 | 9.34 |
| Buffalo W12 | 10.26 |
| Chicago W13 | 9.24 |
| Crawfordsville,Ind. M8 | 9.34 |
| Donora,Pa. A7 | 9.24 |
| Duluth A7 | 9.24 |
| Fairfield,Ala. T2 | 9.24 |
| Houston S5 | 10.51 |
| Jacksonville,Fla. M8 | 9.34 |
| Johnstown,Pa. B2 | 9.24 |
| Joliet,Ill. A7 | 9.24 |
| KansasCity,Mo. S5 | 10.51 |
| Kokomo,Ind. C16 | 9.34 |
| LosAngeles B3 | 9.94 |
| Minnequa,Colo. C10 | 9.49 |
| Pittsburg,Calif. C11 | 9.94 |
| S.Chicago,Ill. R2 | 9.24 |
| S.SanFrancisco C10 | 9.94 |
| SparrowsPt.,Md. B2 | 9.34 |
| Sterling Ill.(37) N15 | 9.34 |

| Coil No. 6500 Stand. | |
|---|---|
| AlabamaCity,Ala. R2 | $9.54 |
| Atlanta A11 | 10.70 |
| Bartonville,Ill. K4 | 9.64 |
| Buffalo W12 | 10.60 |
| Chicago W13 | 9.54 |
| Crawfordsville,Ind. M8 | 9.64 |
| Donora,Pa. A7 | 9.54 |
| Duluth A7 | 9.54 |
| Fairfield,Ala. T2 | 9.54 |
| Houston S5 | 10.85 |
| Jacksonville,Fla. M8 | 9.64 |
| Johnstown,Pa. B2 | 9.54 |
| Joliet,Ill. A7 | 9.54 |
| KansasCity,Mo. S5 | 10.85 |
| Kokomo,Ind. C16 | 9.64 |
| LosAngeles B3 | 10.26 |
| Minnequa,Colo. C10 | 9.79 |
| Pittsburg,Calif. C11 | 10.28 |
| S.Chicago,Ill. R2 | 9.54 |
| S.SanFrancisco C10 | 10.26 |
| SparrowsPt.,Md. B2 | 9.64 |
| Sterling Ill.(37) N15 | 9.64 |

| Coil No. 6500 Interim | |
|---|---|
| AlabamaCity,Ala. R2 | $9.59 |
| Atlanta A11 | 10.75 |
| Bartonville,Ill. K4 | 9.69 |
| Buffalo W12 | 10.65 |
| Chicago W13 | 9.59 |
| Crawfordsville,Ind. M8 | 9.69 |
| Donora,Pa. A7 | 9.59 |
| Duluth A7 | 9.59 |
| Fairfield,Ala. T2 | 9.59 |
| Houston S5 | 10.90 |
| Jacksonville,Fla. M8 | 9.69 |
| Johnstown,Pa. B2 | 9.59 |
| Joliet,Ill. A7 | 9.59 |
| KansasCity,Mo. S5 | 10.90 |
| Kokomo,Ind. C16 | 9.69 |
| LosAngeles B3 | 10.37 |
| Minnequa,Colo. C10 | 9.84 |
| Pittsburg,Calif. C11 | 10.31 |
| S.Chicago,Ill. R2 | 9.59 |
| S.SanFrancisco C10 | 10.31 |
| SparrowsPt.,Md. B2 | 9.69 |
| Sterling Ill.(37) N15 | 9.69 |

| BALE TIES, Single Loop | Col. |
|---|---|
| AlabamaCity,Ala. R2 | 212 |
| Atlanta A11 | 214 |
| Bartonville,Ill. K4 | 214 |
| Crawfordsville,Ind. M8 | 214 |
| Donora,Pa. A7 | 212 |
| Duluth A7 | 212 |
| Fairfield,Ala. T2 | 212 |
| Houston S5 | 217 |
| Jacksonville,Fla. M8 | 214 |
| Joliet,Ill. A7 | 212 |
| KansasCity,Mo. S5 | 217 |
| Kokomo,Ind. C16 | 214 |
| Minnequa,Colo. C10 | 217 |
| Pittsburg,Calif. C11 | 236 |
| S.SanFrancisco C10 | 236 |
| SparrowsPt.,Md. B2 | 214 |
| Sterling,Ill.(7) N15 | 214 |

| FENCE POSTS | Col. |
|---|---|
| Birmingham C15 | 177 |
| ChicagoHts.,Ill. C2, I-2 | 177 |
| Duluth A7 | 177 |
| Franklin,Pa. F5 | 177 |
| Johnstown Pa. B2 | 177 |
| Marion,O. P11 | 177 |
| Minnequa,Colo. C10 | 182 |
| Tonawanda,N.Y. B12 | 177 |

| WIRE, Barbed | Col. |
|---|---|
| AlabamaCity,Ala. R2 | 193* |
| Aliquippa,Pa. J5 | 190§ |
| Atlanta A11 | 198§ |
| Bartonville,Ill. K4 | 198 |
| Crawfordsville,Ind. M8 | 198 |
| Donora,Pa. A7 | 193† |
| Duluth A7 | 193† |
| Fairfield,Ala. T2 | 193† |
| Houston S5 | 198** |
| Jacksonville,Fla. M8 | 198 |
| Johnstown,Pa. B2 | 196§ |
| Joliet,Ill. A7 | 193† |
| KansasCity,Mo. S5 | 198** |
| Kokomo,Ind. C16 | 195† |
| Minnequa,Colo. C10 | 198** |
| Monessen,Pa. P7 | 196§ |
| Pittsburg Calif. C11 | 213† |
| Rankin,Pa. A7 | 193† |
| S.Chicago,Ill. R2 | 193** |
| S.SanFrancisco C10 | 213* |
| SparrowsPoint,Md. B2 | 198§ |
| Sterling,Ill.(7) N15 | 198 |

| WOVEN FENCE, 9-15 Ga. | Col. |
|---|---|
| Ala.City,Ala. R2 | 187** |
| Aliq'ppa,Pa.9-11½ga.J5 | 190§ |
| Atlanta A11 | 192§ |
| Bartonville,Ill. K4 | 192 |
| Crawfordsville,Ind. M8 | 192 |
| Donora,Pa. A7 | 187† |
| Duluth A7 | 187† |
| Fairfield,Ala. T2 | 187† |
| Houston S5 | 192** |
| Jacksonville.Fla. M8 | 192 |
| Johnstown,Pa.(43) B2 | 190§ |
| Joliet,Ill. A7 | 187† |
| KansasCity,Mo. S5 | 192** |
| Kokomo,Ind. C16 | 189† |
| Minnequa Colo. C10 | 192** |
| Pittsburg,Calif. C11 | 210† |
| Rankin,Pa. A7 | 187† |
| S.Chicago,Ill. R2 | 187** |
| Sterling,Ill.(7) N15 | 192 |

| WIRE (16 gage) | An'ld Stone | Galv. Stone |
|---|---|---|
| Ala.City,Ala.R2 | 17.85 | 19.40** |
| Aliq'ppa,Pa. J5 | 17.85 | 19.65 ‡ |
| Bartonville K4 | 17.95 | 19.80 |
| Cleveland A7 | 17.85 | .... |
| Craw'dville M8 | 17.95 | 19.80‡‡ |
| Fostoria,O. S1 | 18.35 | 19.90† |
| Houston S5 | 18.10 | 19.65** |
| Jacksonville M8 | 18.95 | 19.80‡‡ |
| Johnstown B2 | 17.85 | 19.65§ |
| Kan.City,Mo. S5 | 18.10 | .... |
| Kokomo C16 | 17.25 | 18.80† |
| Minnequa C10 | 18.10 | 19.65** |
| P'lm'r,Mass.W12 | 18.15 | 19.70† |
| Pitts.Calif. C11 | 18.20 | 19.75† |
| S.San.Fran. C10 | 18.20 | 19.75** |
| St'ling(37) N15 | 17.95 | 19.80 |
| SparrowsPt. B2 | 17.95 | 19.75§ |
| Waukegan A7 | 17.85 | 19.40† |
| Worcester A7 | 18.15 | .... |

| WIRE, Merchant Quality (6 to 8 gage) | An'd | Galv. |
|---|---|---|
| Ala.City,Ala. R2 | 9.00 | 9.55** |
| Aliquippa J5 | 8.65 | 9.325§ |
| Atlanta(48)A11 | 9.10 | 9.775§ |
| Bartonville(48) K4 | 9.10 | 9.80 |
| Buffalo W12 | 9.00 | 9.55† |
| Cleveland A7 | 9.00 | .... |
| Crawfordsville M8 | 9.10 | 9.80†† |
| Donora,Pa. A7 | 9.00 | 9.55† |
| Duluth A7 | 9.00 | 9.55† |
| Fairfield T2 | 9.00 | 9.55† |
| Houston(48) S5 | 9.25 | 9.80** |
| Jack'ville.Fla. M8 | 9.10 | 9.80‡‡ |
| Johnstown(48) B2 | 9.00 | 9.675§ |
| Joliet.Ill. A7 | 9.00 | 9.55† |
| KansasCity(48)S5 | 9.25 | 9.80** |
| Kokomo(48) S16 | .910 | 9.65† |
| LosAngeles B3 | 9.95 | 10.625§ |
| Minnequa C10 | 9.25 | 9.80** |
| Monessen(48) P7 | 8.65 | 9.35§ |
| Palmer,Mass. W12 | 9.30 | 9.85† |
| Pitts.,Calif. C11 | 9.95 | 10.50† |
| Rankin,Pa. A7 | 9.00 | 9.55† |
| S.Chicago R2 | 9.00 | 9.55** |
| S.SanFran. C10 | 9.95 | 10.50** |
| Spar'wsPt.(48)B2 | 9.10 | 9.775§ |
| St'ling(37)(48) N15 | 9.10 | 9.80 |
| Struthers O. Y1 | 9.00 | 9.65‡ |
| Worcester,Mass.A7 | 9.30 | 9.85† |

Based on zinc prices of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

## FASTENERS

(Consumer discounts, per cent off list prices, orders for 1 container for assorted sizes; for less than container quantities, add 25 per cent; attaching nuts to bolts, package sizes, add 7.5 per cent; heavy hex nuts 1⅛ in. through 1½ in. tapped 8 threads, add 10 per cent)

**HEX HEAD CAP SCREWS,** coarse or fine thread, packaged or bulk, with or without hex nuts, 1020 steel bright and high carbon heat treated, ¼ in. thru 1 in. diam., listed lengths:

| | |
|---|---|
| Plain Finish | 50 |
| Hot Galvanized and Zinc Plated: | |
| Packaged | 43.75 |
| Bulk | 50 |

**BOLTS,** standard stock sizes:

| | |
|---|---|
| Plain Finish | 50 |
| Hot Galvanized and Zinc Plated: | |
| Packaged | 43.75 |
| *Bulk | 50 |

*Hot galvanized or zinc plated lag bolts only—for package or bulk quantities use applicable list less bulk discounts.

**HEXAGON NUTS, American Standard:** Finished hex, hex jam, and hex slotted coarse or fine thread, ¼ in. through 3 in., finished hex thick, thick and slotted, castle, fine thread, ¼ in. through 1½ in., semifinished hex heavy, heavy and jam, heavy and slotted, coarse thread, ¼ in. through 4 in., and

**SQUARE NUTS American Standard:** Regular square and heavy square, coarse thread, ¼ in. through 2 in.:

| | |
|---|---|
| Plain Finish | 50 |
| Hot Galvanized and Zinc Plated: | |
| Packaged | 43.75 |
| Bulk | 50 |

**CAP AND SETSCREWS**

**Fillister Head, Cap Screws, Coarse Thread:**

| | |
|---|---|
| Packages | +55 |
| Bulk | +16 |

**Flat Head Cap Screws:**

| | |
|---|---|
| ⅜ in. and smaller, 6 in. and shorter: | |
| Packages | +85 |
| Bulk | +38 |

**Setscrews, Square Head, Cup Point, Coarse Thread:**

| | |
|---|---|
| Through 1 in. diam, 6 in. and shorter: | |
| Packages | + 5 |
| Bulk | +19 |
| Through 1 in. diam., longer than 6 in.: | |
| Packages | +29 |

## RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85

7/16 in. and smaller by 6 in. and shorter: 15% off list.

## PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

| | Standard Diameter, Inches | | | | |
|---|---|---|---|---|---|
| | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 |
| Alton,Ill. L1 | $28.95 | $43.40 | $55.40 | $73.00 | $95.10 |
| Buffalo W12 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| Cleveland A7 | 28.95 | 43.40 | 55.40 | 73.00 | .... |
| KansasCity,Mo. U3 | 29.85 | 43.00 | 55.40 | 73.00 | 95.10 |
| Monessen,Pa. P16 | 32.15 | 48.20 | 61.55 | 81.10 | 105.65 |
| NewHaven,Conn. A7 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| Pittsburg,Calif C11 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| Minnequa,Colo. C10 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| Roebling N.J. R5 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| SparrowsPoint,Md. B2 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| St. Louis L8 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |
| Waukegan,Ill. A7 | 28.95 | 43.40 | 55.40 | 73.00 | 95.10 |

## BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

| O.D. In. | B.W. Gage | Seamless H.R. | Seamless C.D. | Elec. Weld H.R. |
|---|---|---|---|---|
| 1 | 13 | .... | 27.24 | 23.13 |
| 1¼ | 13 | .... | 32.25 | 24.41 |
| 1½ | 13 | 30.42 | 35.65 | 26.98 |
| 1¾ | 13 | 35.94 | 42.12 | 31.89 |
| 2 | 13 | 40.28 | 47.21 | 35.74 |
| 2¼ | 13 | 45.36 | 53.17 | 40.26 |
| 2¼ | 12 | 49.24 | 57.72 | 43.70 |
| 2½ | 12 | 54.23 | 63.57 | 48.13 |
| 2¾ | 12 | 58.73 | 68.83 | 52.13 |
| 3 | 12 | 62.62 | 73.40 | 55.59 |

## RAILWAY MATERIALS

| Rails | Standard No. 1 | Standard No. 2 | All No. 2 | Tee Rails 60 lb Under |
|---|---|---|---|---|
| Bessemer,Pa. U5 | 5.75 | 5.60 | .... | 6.725 |
| Ensley,Ala. T2 | 5.75 | 5.65 | .... | 6.725 |
| Fairfield,Ala. T2 | .... | .... | .... | 6.725 |
| Gary,Ind. U5 | 5.75 | 5.65 | .... | .... |
| Huntington,W.Va. C15 | .... | .... | .... | 6.725 |
| Johnstown,Pa. B2 | .... | .... | .... | (16)6.725 |
| Lackawanna,N.Y. B2 | 5.75 | 5.65 | .... | 6.725 |
| Minnequa,Colo. C10 | 5.75 | 5.65 | .... | 7.225 |
| Steelton,Pa. B2 | 5.75 | 5.65 | .... | .... |
| Williamsport Pa. S19 | .... | .... | .... | 6.725 |

| TIE PLATES | |
|---|---|
| Fairfield,Ala. T2 | 6.875 |
| Gary,Ind. U5 | 6.875 |
| Lackawanna,N.Y. B2 | 6.875 |
| Minnequa Colo. C10 | 6.875 |
| Seattle B3 | 7.025 |
| Steelton,Pa. B2 | 6.875 |
| Torrance,Calif. C11 | 6.875 |

| JOINT BARS | |
|---|---|
| Bessemer,Pa. U5 | 7.25 |
| Fairfield,Ala. T2 | 7.25 |
| Joliet,Ill. U5 | 7.25 |
| Lackawanna,N.Y. B2 | 7.25 |
| Minnequa,Colo. C10 | 7.25 |
| Steelton,Pa. B2 | 7.25 |

| AXLES | |
|---|---|
| Ind.Harbor,Ind. S13 | 9.125 |
| Johnstown,Pa. B2 | 9.125 |

| TRACK BOLTS, Untreated | |
|---|---|
| Cleveland R2 | 15.35 |
| KansasCity,Mo. S5 | 15.35 |
| Lebanon,Pa. B2 | 15.35 |
| Minnequa,Colo. C10 | 15.35 |
| Pittsburgh S44 | 15.35 |
| Seattle B3 | 15.85 |

| SCREW SPIKES | |
|---|---|
| Lebanon,Pa. B2 | 15.10 |

| STANDARD TRACK SPIKES | |
|---|---|
| Fairfield,Ala. T2 | 10.10 |
| Ind.Harbor,Ind. I-2 Y1 | 10.10 |
| KansasCity,Mo. S5 | 10.10 |
| Lebanon,Pa. B2 | 10.10 |
| Minnequa,Colo. C10 | 10.10 |
| Pittsburgh J5 | 10.10 |
| Seattle B3 | 10.60 |
| S.Chicago,Ill. R2 | 10.10 |
| Struthers,O. Y1 | 10.10 |
| Youngstown R2 | 10.10 |

### Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds, 9.65c, over 3½ in. and other shapes.

## SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| Size—Inches | 2 | | 2½ | | 3 | | 3½ | | 4 | | 5 | | 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 37c | | 58.5c | | 76.5c | | 92c | | $1.09 | | $1.48 | | $1.92 | |
| Pounds Per Ft | 3.68 | | 5.82 | | 7.62 | | 9.20 | | 10.89 | | 14.81 | | 19.18 | |
| | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* |
| Aliquippa, Pa. J5 | +12.25 | +28.75 | +5.75 | +23.5 | +3.25 | +21 | +1.75 | +19.5 | +1.75 | +19.5 | +2 | +19.75 | 0.5 | +17.25 |
| Ambridge, Pa. N2 | +12.25 | .... | +5.75 | .... | +3.25 | .... | +1.75 | .... | +1.75 | .... | +2 | .... | 0.5 | .... |
| Lorain, O. N3 | +12.25 | +28.75 | +5.75 | +23.5 | +3.25 | +21 | +1.75 | +19.5 | +1.75 | +19.5 | +2 | +19.75 | 0.5 | +17.25 |
| Youngstown Y1 | +12.25 | +28.75 | +5.75 | +23.5 | +3.25 | +21 | +1.75 | +19.5 | +1.75 | +19.5 | +2 | +19.75 | 0.5 | +17.25 |

## ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Youngstown R2 | +12.25 | +28.75 | +5.75 | +23.5 | +3.25 | +21 | +1.75 | +19.5 | +1.75 | +19.5 | +2 | +19.75 | 0.5 | +17.25 |

## BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

| Size—Inches | ⅛ | | ¼ | | ⅜ | | ½ | | ¾ | | 1 | | 1¼ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 5.5c | | 6c | | 6c | | 8.5c | | 11.5c | | 17c | | 23c | |
| Pounds Per Ft | 0.24 | | 0.42 | | 0.57 | | 0.85 | | 1.13 | | 1.68 | | 2.28 | |
| | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* |
| Aliquippa, Pa. J5 | .... | .... | .... | .... | .... | .... | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Alton, Ill. L1 | .... | .... | .... | .... | .... | .... | 0.25 | +17 | 3.25 | +13 | 6.75 | +8.5 | 9.25 | +7.25 |
| Benwood, W. Va. W10 | 1.5 | +27 | +10.5 | +36 | +21 | +45.5 | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Butler, Pa. F6 | 4.5 | +24 | +8.5 | +34 | +19.5 | +44 | .... | .... | .... | .... | .... | .... | .... | .... |
| Etna, Pa. N2 | .... | .... | .... | .... | .... | .... | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Fairless, Pa. N3 | .... | .... | .... | .... | .... | .... | 0.25 | +17 | 3.25 | +13 | 6.75 | +8.5 | 9.25 | +7.25 |
| Fontana, Calif. K1 | .... | .... | .... | .... | .... | .... | +10.75 | +28 | +7.75 | +24 | +4.25 | +19.5 | +1.75 | +18.25 |
| Indiana Harbor, Ind. Y1 | .... | .... | .... | .... | .... | .... | 1.25 | +16 | 4.25 | +12 | 7.75 | +7.5 | 10.25 | +6.25 |
| Lorain, O. N3 | .... | .... | .... | .... | .... | .... | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Sharon, Pa. S4 | 4.5 | +24 | +8.5 | +34 | +19.5 | +44 | .... | .... | .... | .... | .... | .... | .... | .... |
| Sharon, Pa. M6 | .... | .... | .... | .... | .... | .... | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Sparrows Pt., Md. B2 | 2.5 | +26 | +10.5 | +36 | +21.5 | +46 | 0.25 | +17 | 3.25 | +13 | 6.75 | +8.5 | 9.25 | +7.25 |
| Wheatland, Pa. W9 | 4.5 | +24 | +8.5 | +34 | +19.5 | +44 | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |
| Youngstown R2, Y1 | .... | .... | .... | .... | .... | .... | 2.25 | +15 | 5.25 | +11 | 8.75 | +6.5 | 11.25 | +5.25 |

| Size—Inches | 1½ | | 2 | | 2½ | | 3 | | 3½ | | 4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| List Per Ft | 27.5c | | 37c | | 58.5c | | 76.5c | | 92c | | $1.09 | |
| Pounds Per Ft | 2.72 | | 3.68 | | 5.82 | | 7.62 | | 9.20 | | 10.89 | |
| | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* | Blk | Galv* |
| Aliquippa, Pa. J5 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | 3.25 | +14.5 | 3.25 | +14.5 |
| Alton, Ill. L1 | 9.75 | +6.25 | 10.25 | +5.75 | 11.75 | +5.5 | 11.75 | +5.5 | 1.25 | +16.5 | 1.25 | +16.5 |
| Benwood, W. Va. W10 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | 3.25 | +14.5 | 3.25 | +14.5 |
| Etna, Pa. N2 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | 3.25 | +14.5 | 3.25 | +14.5 |
| Fairless, Pa. N3 | 9.75 | +6.25 | 10.25 | +5.75 | 11.75 | +5.5 | 11.75 | +5.5 | 1.25 | +16.5 | 1.25 | +16.5 |
| Fontana, Calif. K1 | +1.25 | +17.25 | +0.75 | +16.75 | 0.75 | +16.5 | 0.75 | +16.5 | +9.75 | +27.5 | +9.75 | +27.5 |
| Indiana Harbor, Ind. Y1 | 10.75 | +5.25 | 11.25 | +4.75 | 12.75 | +4.5 | 12.75 | +4.5 | 2.25 | +15.5 | 2.25 | +15.5 |
| Lorain, O. N3 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | .... | .... | .... | .... |
| Sharon, Pa. M6 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | .... | .... | .... | .... |
| Sparrows Pt., Md. B2 | 9.75 | +6.25 | 10.25 | +5.75 | 11.75 | +5.5 | 11.75 | +5.5 | 1.25 | +16.5 | 1.25 | +16.5 |
| Wheatland, Pa. W9 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | 3.25 | +14.5 | 3.25 | +14.5 |
| Youngstown R2, Y1 | 11.75 | +4.25 | 12.25 | +3.75 | 13.75 | +3.5 | 13.75 | +3.5 | 3.25 | +14.5 | 3.25 | +14.5 |

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*Galvanized pipe discounts based on price of zinc at 13.00c, East St. Louis.

# Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

| | —Rerolling— | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AISI Type | Ingot | Slabs | Forging Billets | H.R. Strip | H.R. Rods; C.F. Wire | Bars; Structural Shapes | Plates | Sheets | C.R. Strip; Flat Wire |
| 201 | 22.75 | 25.00 | .... | 36.00 | .... | 43.50 | 39.25 | 48.50 | 45.00 |
| 202 | 24.75 | 28.25 | 37.75 | 39.00 | 42.25 | 44.50 | 40.00 | 49.25 | 49.25 |
| 301 | 24.00 | 26.00 | 38.75 | 37.25 | 43.50 | 46.00 | 41.25 | 51.25 | 47.50 |
| 302 | 26.25 | 29.50 | 39.50 | 40.50 | 44.25 | 46.75 | 42.25 | 52.00 | 52.00 |
| 302B | 26.50 | 30.75 | 42.25 | 45.75 | 46.75 | 49.00 | 44.50 | 57.00 | 57.00 |
| 303 | .... | 33.25 | 42.50 | .... | 47.25 | 49.75 | 45.00 | 56.75 | 56.75 |
| 304 | 28.00 | 31.25 | 42.00 | 43.75 | 47.00 | 49.50 | 45.75 | 55.00 | 55.00 |
| 304L | .... | .... | 49.75 | 51.50 | 54.75 | 57.25 | 53.50 | 62.75 | 62.75 |
| 305 | 29.50 | 34.75 | 44.00 | 47.50 | 47.00 | 49.50 | 46.25 | 58.75 | 58.75 |
| 308 | 32.00 | 36.25 | 49.00 | 50.25 | 54.75 | 57.75 | 55.25 | 63.00 | 63.00 |
| 309 | 41.25 | 47.50 | 60.00 | 64.50 | 66.25 | 69.50 | 66.00 | 80.50 | 80.50 |
| 310 | 51.50 | 59.50 | 81.00 | 84.25 | 89.75 | 94.50 | 87.75 | 96.75 | 96.75 |
| 314 | .... | .... | 80.50 | .... | 89.75 | 94.50 | 87.75 | .... | 104.25 |
| 316 | 41.25 | 47.50 | 64.50 | 68.50 | 71.25 | 75.75 | 71.75 | 80.75 | 80.75 |
| 316L | .... | .... | 72.25 | 76.25 | 79.50 | 83.50 | 79.50 | 88.50 | 88.50 |
| 317 | 49.75 | 58.00 | 79.75 | 88.25 | 89.50 | 94.25 | 88.50 | 101.00 | 101.00 |
| 321 | 33.50 | 38.00 | 48.75 | 53.50 | 54.50 | 57.50 | 54.75 | 65.00 | 65.50 |
| 330 | .... | .... | 123.25 | .... | 113.00 | 143.75 | 135.00 | 149.25 | 149.25 |
| 18-8 CbTa | 38.50 | 48.25 | 57.75 | 63.50 | 63.75 | 67.25 | 64.75 | 79.25 | 79.25 |
| 403 | .... | .... | 29.25 | .... | 33.25 | 35.00 | 30.00 | 40.25 | 40.25 |
| 405 | 20.25 | 26.50 | 30.75 | 36.00 | 34.75 | 36.50 | 32.50 | 46.75 | 46.75 |
| 410 | 17.50 | 19.50 | 29.25 | 31.00 | 33.25 | 35.00 | 30.00 | 40.25 | 40.25 |
| 416 | .... | .... | 29.75 | .... | 33.75 | 35.50 | 31.25 | 48.25 | 48.25 |
| 420 | .... | 31.50 | 35.50 | 41.75 | 40.75 | 42.75 | 40.25 | 62.00 | 62.00 |
| 430 | 17.75 | 19.75 | 29.75 | 32.00 | 33.75 | 35.50 | 31.00 | 40.75 | 40.75 |
| 430F | .... | .... | 30.50 | .... | 34.25 | 36.00 | 31.75 | 51.75 | 51.75 |
| 431 | .... | 29.75 | 39.25 | .... | 43.50 | 46.00 | 41.00 | 56.00 | 56.00 |
| 446 | .... | .... | 40.75 | 59.00 | 46.00 | 48.25 | 42.75 | 70.00 | 70.00 |

**Producers Are:** Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

# Clad Steel

| | —Plates— Carbon Base | | | | Sheets Carbon Base |
|---|---|---|---|---|---|
| | 5% | 10% | 15% | 20% | 20% |
| Stainless | | | | | |
| 302 | .... | .... | .... | .... | 37.50 |
| 304 | 26.05 | 28.80 | 31.55 | 34.30 | 39.75 |
| 304L | 30.50 | 33.75 | 36.95 | 40.15 | .... |
| 316 | 38.20 | 42.20 | 46.25 | 50.25 | 58.25 |
| 316L | 42.30 | 46.75 | 51.20 | 55.65 | .... |
| 316 Cb | 49.90 | 55.15 | 60.40 | 65.65 | .... |
| 321 | 31.20 | 34.50 | 37.75 | 41.05 | 47.25 |
| 347 | 36.90 | 40.80 | 44.65 | 48.55 | 57.00 |
| 405 | 22.25 | 24.60 | 26.90 | 29.25 | .... |
| 410 | 20.55 | 22.70 | 24.85 | 27.00 | .... |
| 430 | 21.20 | 23.45 | 25.65 | 27.90 | .... |
| Inconel | 48.90 | 59.55 | 70.15 | 80.55 | .... |
| Nickel | 41.65 | 51.95 | 63.30 | 72.70 | .... |
| Nickel, Low Carbon | 41.95 | 52.60 | 63.30 | 74.15 | .... |
| Monel | 43.35 | 53.55 | 63.80 | 74.05 | .... |

| | Strip, Carbon Base —Cold Rolled— 10% | Both Sides |
|---|---|---|
| Copper* | $36.80 | $44.20 |

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*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

# Tool Steel

| Grade | $ per lb | Grade | $ per lb |
|---|---|---|---|
| Reg. Carbon (W-1) | 0.330 | V-Cr Hot Work (H-13) | 0.550 |
| Spec. Carbon (W-1) | 0.385 | W-Cr Hot Work (H-12) | 0.530 |
| Oil Hardening (O-1) | 0.505 | W Hot Wk. (H-21) | 1.425-1.44 |
| V-Cr Hot Work (H-11) | 0.505 | Hi-Carbon-Cr (D-11) | 0.955 |

| —Grade by Analysis (%)— | | | | | AISI | |
|---|---|---|---|---|---|---|
| W | Cr | V | Co | Mo | Designation | $ per lb |
| 18 | 4 | 1 | .... | ... | T-1 | 1.840 |
| 18 | 4 | 2 | .... | ... | T-2 | 2.005 |
| 13.5 | 4 | 3 | .... | ... | T-3 | 2.105 |
| 18.25 | 4.25 | 1 | 4.75 | ... | T-4 | 2.545 |
| 18 | 4 | 2 | 9 | ... | T-5 | 2.915 |
| 20.25 | 4.25 | 1.6 | 12.95 | ... | T-6 | 4.330 |
| 13.75 | 3.75 | 2 | 5 | ... | T-8 | 2.485 |
| 1.5 | 4 | 1 | .... | 8.5 | M-1 | 1.200 |
| 6.4 | 4.5 | 1.9 | .... | 5 | M-2 | 1.345 |
| 6 | 4 | 3 | .... | 6 | M-3 | 1.590 |

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

# Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

| | Basic | No. 2 Foundry | Malleable | Bessemer |
|---|---|---|---|---|
| ***Birmingham District*** | | | | |
| Birmingham R2 | 62.00 | 62.50** | .... | .... |
| Birmingham U6 | .... | 62.50** | 66.50 | .... |
| Woodward, Ala. W15 | 62.00* | 62.50** | 66.50 | .... |
| Cincinnati, deld. | .... | 70.20 | .... | .... |
| ***Buffalo District*** | | | | |
| Buffalo H1, R2 | 66.00 | 66.50 | 67.00 | 67.50 |
| N.Tonawanda, N.Y. T9 | .... | 66.50 | 67.00 | 67.50 |
| Tonawanda, N.Y. W12 | 66.00 | 66.50 | 67.00 | 67.50 |
| Boston, deld. | 77.29 | 77.79 | 78.29 | .... |
| Rochester, N.Y., deld. | 69.02 | 69.52 | 70.02 | .... |
| Syracuse, N.Y., deld. | 70.12 | 70.62 | 71.12 | .... |
| ***Chicago District*** | | | | |
| Chicago I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| S.Chicago, Ill. R2 | 66.00 | 66.50 | 66.50 | 67.00 |
| S.Chicago, Ill. W14 | 66.00 | .... | 66.50 | 67.00 |
| Milwaukee, deld. | 69.02 | 69.52 | 69.52 | 70.02 |
| Muskegon, Mich., deld. | .... | 74.52 | 74.52 | .... |
| ***Cleveland District*** | | | | |
| Cleveland R2, A7 | 66.00 | 66.50 | 66.50 | 67.00 |
| Akron, Ohio deld. | 69.52 | 70.02 | 70.02 | 70.52 |
| ***Mid-Atlantic District*** | | | | |
| Birdsboro, Pa. B10 | 68.00 | 68.50 | 69.00 | 69.50 |
| Chester, Pa. P4 | Nom. | Nom. | Nom. | .... |
| Swedeland, Pa. A3 | 68.00 | 68.50 | 69.00 | 69.50 |
| NewYork, deld. | .... | 75.50 | 76.00 | .... |
| Newark, N.J., deld. | 72.69 | 73.19 | 73.69 | 74.19 |
| Philadelphia, deld. | 70.41 | 70.91 | 71.41 | 71.99 |
| Troy, N.Y. R2 | 68.00 | 68.50 | 69.00 | 69.50 |
| ***Pittsburgh District*** | | | | |
| NevilleIsland, Pa. P6 | 66.00 | 66.50 | 66.50 | 67.00 |
| Pittsburgh (N&S sides), Aliquippa, deld. | .... | 67.95 | 67.95 | 68.48 |
| McKeesRocks, Pa., deld. | .... | 67.60 | 67.60 | 68.13 |
| Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld. | .... | 68.26 | 68.26 | 69.79 |
| Verona, Trafford, Pa., deld. | 68.29 | 68.82 | 68.82 | 69.35 |
| Brackenridge, Pa., deld. | 68.60 | 69.10 | 69.10 | 69.63 |
| Midland, Pa. C18 | 66.00 | .... | .... | .... |
| ***Youngstown District*** | | | | |
| Hubbard, Ohio Y1 | .... | .... | 66.50 | .... |
| Sharpsville, Pa. S6 | 66.00 | .... | 66.50 | 67.00 |
| Youngstown Y1 | .... | .... | 66.50 | .... |
| Mansfield, Ohio, deld. | 71.30 | .... | 71.80 | 72.30 |

| | Basic | No. 2 Foundry | Malleable | Bessemer |
|---|---|---|---|---|
| Duluth I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| Erie, Pa. I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| Everett, Mass. E1 | 67.50 | 68.00 | 68.50 | .... |
| Fontana, Calif. K1 | 75.00 | 75.50 | .... | .... |
| Geneva, Utah C11 | 66.00 | 66.50 | .... | .... |
| GraniteCity, Ill. G4 | 67.90 | 68.40 | 68.90 | .... |
| Ironton, Utah C11 | 66.00 | 66.50 | .... | .... |
| Minnequa, Colo. C10 | 68.00 | 68.50 | 69.00 | .... |
| Rockwood, Tenn. T3 | .... | 62.50‡ | 66.50 | .... |
| Toledo, Ohio I-3 | 66.00 | 66.50 | 66.50 | 67.00 |
| Cincinnati, deld. | 72.94 | 73.44 | .... | .... |

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*Phos. 0.70-0.90% Phos. 0.30-0.69%, $63.

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

## PIG IRON DIFFERENTIALS

*Silicon:* Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

*Manganese:* Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

## BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

| | |
|---|---|
| Jackson, Ohio I-3, J1 | $78.00 |
| Buffalo H1 | 79.25 |

## ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

| | |
|---|---|
| CalvertCity, Ky. P15 | $99.00 |
| NiagaraFalls, N.Y. P15 | 99.00 |
| Keokuk, Iowa Open-hearth & Fdry, K2 | 89.00 |
| Keokuk, Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, K2 | 92.00 |

## LOW PHOSPHORUS PIG IRON, Gross Ton

| | |
|---|---|
| Lyles, Tenn. T3 (Phos. 0.035% max) | $73.00 |
| Rockwood, Tenn. T3 (Phos. 0.035% max) | 73.00 |
| Troy, N.Y. R2 (Phos. 0.075% max) | 73.00 |
| Swedeland, Pa. A3 (Intermediate) (Phos. 0.036-0.075% max) | 73.00 |
| Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max) | 71.00 |
| Duluth I-3 (Intermediate) (Phos. 0.036-0.075%) | 71.00 |
| Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max) | 71.00 |
| NevilleIsland, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max). | 71.00 |

# Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

| | SHEETS | | | | STRIP | BARS | | | Standard | PLATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hot-Rolled | Cold-Rolled | Galv. 10 Ga.† | Stainless Type 302 | Hot-Rolled* | H.R. Rounds | C.F. Rds.‡ | H.R. Alloy 4140††[5] | Structural Shapes | Carbon | Floor |
| Atlanta | 8.59§ | 9.86§ | 10.13 | .... | 8.91 | 9.39 | 13.24# | .... | 9.40 | 9.29 | 11.21 |
| Baltimore | 9.80(a) | 10.00(b) | 10.06 | .... | 11.45(c) | 10.05(d) | 11.80# | 16.38 | 9.55 | 9.90(e) | 10.50 |
| Birmingham | 9.43(a) | 10.20(b) | .... | .... | 10.91(c) | 9.59(d) | 13.14# | 16.76 | 9.00 | 9.79(e) | 10.90 |
| Boston | 10.07 | 11.42 | 11.77 | 53.50 | 12.17 | 10.19 | 13.30# | 15.64 | 10.64 | 10.27 | 11.95 |
| Buffalo | 8.80(a) | 9.95(b) | 11.15 | 55.98 | 10.65(e) | 9.00(d) | 11.45# | 15.40 | 9.25 | 9.00(e) | 10.85(f) |
| Chattanooga | 8.35 | 9.69 | 9.65 | .... | 8.40 | 8.77 | 10.46 | .... | 8.88 | 8.80 | 10.66 |
| Chicago | 8.25 | 9.45 | 10.90 | 53.00 | 8.51 | 8.99 | 9.15 | 15.05 | 9.00 | 8.89 | 10.20 |
| Cincinnati | 8.43 | 9.51 | 10.95 | 53.43 | 8.83 | 9.31 | 11.58# | 15.37 | 9.56 | 9.27 | 10.53 |
| Cleveland | 8.54(a) | 8.79(b) | 10.94 | 52.33 | 10.32(c) | 8.75(d) | 11.25# | 15.16 | 9.39 | 8.71(e) | 10.50(f) |
| Dallas | 8.80 | 9.30 | .... | .... | 8.85 | 8.80 | .... | .... | 8.75 | 9.15 | 10.40 |
| Denver | 9.40 | 11.84 | 12.94 | .... | 9.43 | 9.80 | 11.19 | .... | 9.84 | 9.76 | 11.08 |
| Detroit | 8.51 | 9.71 | 11.25 | 56.50 | 8.88 | 9.30 | 9.51 | 15.33 | 9.56 | 9.26 | 10.46 |
| Erie, Pa. | 8.35 | 9.45 | 9.95[10] | .... | 8.60 | 9.10 | 11.25 | .... | 9.35 | 9.10 | 10.60 |
| Houston | 9.65(a) | 9.65(b) | .... | 52.00 | 10.85(c) | 8.90(d) | 13.10# | 16.55 | 8.35 | 9.65(e) | 10.10 |
| Jackson, Miss. | 8.52 | 9.79 | .... | .... | 8.84 | 9.82 | 10.68 | .... | 9.33 | 9.22 | 11.03 |
| Los Angeles | 8.70[2] | 10.82[2] | 12.20 | 57.60 | 9.15 | 9.10[2] | 12.95[2] | 16.35 | 9.00[2] | 9.10[2] | 11.30[2] |
| Memphis, Tenn. | 8.59 | 9.80 | .... | .... | 8.84 | 9.32 | 11.25# | .... | 9.33 | 9.22 | 10.86 |
| Milwaukee | 8.39 | 9.59 | 11.04 | .... | 8.65 | 9.13 | 9.39 | 15.19 | 9.22 | 9.03 | 10.34 |
| Moline, Ill. | 8.55 | 9.80 | .... | .... | 8.84 | 8.95 | 9.15 | .... | 8.99 | 8.91 | .... |
| New York | 9.17 | 10.49 | 11.35 | 53.08 | 9.64 | 9.99 | 13.25# | 15.50 | 9.74 | 9.77 | 11.05 |
| Norfolk, Va. | 8.65 | .... | .... | .... | 9.15 | 9.30 | 12.75 | .... | 9.65 | 9.10 | 10.50 |
| Philadelphia | 8.20 | 9.55 | 10.89 | 52.17 | 9.25 | 9.40 | 11.95# | 15.48 | 9.10 | 9.15 | 10.40** |
| Pittsburgh | 8.73(a) | 9.88(b) | 11.03 | 52.33 | 10.49(c) | 8.85(d) | 11.25# | 15.05 | 9.00 | 8.68(e) | 10.32(f) |
| Richmond, Va. | 8.65 | .... | 10.79 | .... | 9.15 | 9.55 | .... | .... | 9.65 | 9.10 | 10.60 |
| St. Louis | 8.72(a) | 9.83 | 11.28 | .... | 10.38 | 8.81(d) | 9.78 | 15.43 | 9.48 | 8.64(e) | 10.43(f) |
| St. Paul | 8.80(a) | 9.31(b) | 10.54 | .... | 10.32(c) | 8.70(d) | 11.49# | 16.54 | 9.38 | 8.60(e) | 10.49 |
| San Francisco | 9.65 | 11.10 | 11.55 | 55.10 | 9.75 | 10.15 | 13.60 | 16.25 | 9.85 | 10.00 | 12.35 |
| Seattle | 10.30 | 11.55 | 12.50 | 56.52 | 10.25 | 10.50 | 14.70 | 16.80[2] | 10.20 | 10.10 | 12.50 |
| South'ton, Conn. | 9.07 | 10.33 | 10.71 | .... | 9.48 | 9.74 | .... | .... | 9.57 | 9.57 | 10.91 |
| Spokane, Wash. | 10.30 | 11.55 | 12.50 | 57.38 | 10.75 | 11.00 | 14.70 | 16.80 | 10.20 | 10.10 | 13.00 |
| Washington | 9.15 | .... | .... | .... | 9.65 | 10.05 | 12.50 | .... | 10.15 | 9.60 | 11.10 |

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*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

(a)10 Ga.; (b)20 Ga.; (c)⅛ x 1 in.; (d)¾-2 15/16 in.; (e)¼ x 84 in.; (f)¼ x 36 in.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

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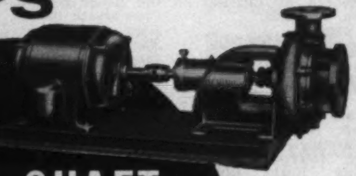

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*

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# Refractories

**Fire Clay Brick (per 1000 pieces*)**

*High-Heat Duty:* Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

*Super-Duty:* Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

**Silica Brick (per 1000 pieces*)**

*Standard:* Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

*Super-Duty:* Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

**Semisilica Brick (per 1000 pieces*)**

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

**Ladle Brick (per 1000 pieces*)**

*Dry Pressed:* Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

**High-Alumina Brick (per 1000 pieces*)**

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

**Sleeves (per 1000)**

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

**Nozzles (per 1000)**

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

**Runners (per 1000)**

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

**Dolomite (per net ton)**

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

**Magnesite (per net ton)**

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

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*—9 in. x 4½ x 2.50 straights.

# Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective $CaF_2$ content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid $26.50-$27; barge, Brownsville, Tex., $29-$29.50.

# Electrodes

Threaded with nipple; unboxed, f.o.b. plant

**GRAPHITE**

| ——Inches—— | | Per |
|---|---|---|
| Diam | Length | 100 lb |
| 2 | 24 | $64.00 |
| 2½ | 30 | 41.50 |
| 3 | 40 | 39.25 |
| 4 | 40 | 37.00 |
| 5½ | 40 | 36.50 |
| 6 | 60 | 33.25 |
| 7 | 60 | 29.75 |
| 8, 9, 10 | 60 | 29.50 |
| 12 | 72 | 28.25 |
| 14 | 60 | 28.25 |
| 16 | 72 | 27.25 |
| 17 | 60 | 27.25 |
| 18 | 72 | 27.00 |
| 20 | 72 | 26.50 |
| 24 | 84 | 27.25 |

**CARBON**

| | | |
|---|---|---|
| 8 | 60 | 14.25 |
| 10 | 60 | 13.80 |
| 12 | 60 | 14.75 |
| 14 | 60 | 14.75 |
| 14 | 72 | 12.55 |
| 17 | 60 | 12.65 |
| 17 | 72 | 12.10 |
| 20 | 90 | 11.55 |
| 24 | 72, 84 | 11.95 |
| 24 | 96 | 12.10 |
| 30 | 84 | 12.00 |
| 35, 40 | 110 | 11.60 |
| 40 | 100 | 12.50 |

# Metal Powder

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

| | Cents |
|---|---|
| Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River: | |
| 100 mesh, bags | 11.50 |
| 100 mesh, pails | 9.85§ |
| 40 mesh, bags | 8.10†† |
| Electrolytic Iron, | |
| Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in. | 28.75 |
| (In contract lots of 240 tons price is 22.75c) | |
| Annealed, 99.5% Fe | 36.75 |
| Unannealed (99+% Fe) | 33.25 |
| Unannealed (99+% Fe) (minus 325 mesh) | 58.25 |
| Powder Flake (minus 16 plus 100 mesh) | 29.25 |
| Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh. | |
| Aluminum: Atomized, 500-lb drum freight allowed, c.l. 38.50; ton lots 40.50 | |
| Antimony, 500-lb lots | 42.00* |
| Brass, 500-lb lots | 35.60-52.90† |
| Bronze, 5000-lb lots | 54.00-57.60† |
| Copper, electrolytic | 14.25* |
| Copper, reduced | 14.25* |
| Lead | 7.50* |
| Manganese, Electrolytic: Minus 35 mesh | $1.00 |
| Nickel | $1.15 |
| Nickel-Silver, 5000-lb lots | 60.90-69.70† |
| Phosphor-Copper, 5000-lb lots | 67.00 |
| Copper (atomized) 5000-lb lots | 47.50-65.50 |
| Solder | 7.00* |
| Silicon | 70.00* |
| Stainless Steel, 304 | 89.00* |
| Stainless Steel, 316 | $1.07 |
| Tin | 14.00* |
| Zinc, 5000-lb lots | 21.20-34.40‡ |
| Tungsten: | Dollars |
| Carbon reduced, 98.8% min., minus 65 mesh | nom** |
| Chromium electrolytic 99.8% Cr, min., metallic basis | 5.00 |

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*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

# Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

| | North Atlantic | Great Lakes | South Atlantic | Gulf Coast | West Coast |
|---|---|---|---|---|---|
| Deformed Bars, Intermediate, ASTM-A 305 | $6.59 | $6.64 | $6.49 | $6.34 | $6.74 |
| Bar Size Angles | 6.25 | 6.30 | 6.15 | 6.05 | 6.40 |
| Structural Angles | 6.16 | 6.21 | 6.06 | 5.96 | 6.31 |
| I-Beams | 6.16 | 6.21 | 6.06 | 5.96 | 6.31 |
| Channels | 6.16 | 6.21 | 6.06 | 5.96 | 6.31 |
| Plates (basic bessemer) | 6.28 | 6.33 | 6.18 | 6.08 | 6.43 |
| Sheets, H.R. | 7.50 | 7.55 | 7.40 | 7.30 | 7.65 |
| Sheets, Galvanized, 20 Ga., 36 in. x 96 in. | 9.70 | 9.75 | 9.60 | 9.50 | 9.85 |
| Sheets, Galv. (in. coils) 20 Ga., 48 in. wide | 9.80 | 9.85 | 9.70 | 9.60 | 9.95 |
| Sheets, C.R. (drawing quality) | 10.70 | 10.75 | 10.60 | 10.50 | 10.85 |
| Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft | 25.08 | 24.20 | 24.42 | 24.15 | 25.47 |
| Barbed Wire (†) | 6.80 | 6.85 | 6.70 | 6.60 | 6.95 |
| Merchant Bars | 6.69 | 6.74 | 6.59 | 6.49 | 6.84 |
| Hot-Rolled Bands | 7.90 | 7.95 | 7.80 | 7.70 | 8.05 |
| Wire Rods, Thomas Commercial No. 5 | 6.60 | .... | 6.45 | 6.45 | 6.70 |
| Wire Rods, O. H. | 7.05 | .... | 6.90 | 6.90 | 7.15 |
| Bright Common Wire Nails (§) | 8.15 | 8.20 | 8.05 | 7.95 | 8.30 |

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†Per 82 lb net reel. §Per 100-lb keg, 20d nails and heavier.

# Ores

**Lake Superior Iron Ore**

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

| | |
|---|---|
| Mesabi bessemer | $11.60 |
| Mesabi nonbessemer | 11.45 |
| Old Range bessemer | 11.85 |
| Old Range nonbessemer | 11.70 |
| Open-hearth lump | 12.70 |
| High phos. | 11.45 |

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

**Eastern Local Iron Ore**

Cents per unit, deld. E. Pa.

| | |
|---|---|
| New Jersey, concentrates | nom. |

**Foreign Iron Ore**

Cents per unit, c.i.f. Atlantic ports

| | |
|---|---|
| Swedish basic, 65% | 21.00† |
| Brazilian iron ore, 68.5% | 21.00 |

**Tungsten Ore**

Net ton, unit

| | |
|---|---|
| Foreign wolframite, good commercial quality | $17.50-18.00* |
| Domestic, concentrates, f.o.b. milling points | 22.00-23.00 |

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*Before duty. †Nominal.

**Manganese Ore**

Mn 46-48%, Indian 88-90c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

**Chrome Ore**

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

*Indian and Rhodesian*

| | |
|---|---|
| 48% 3:1 | $34.00-35.00† |
| 48% no ratio | 25.00-26.00† |

*South African Transvaal*

| | |
|---|---|
| 44% no ratio | 18.00† |
| 48% no ratio | 24.00-26.00† |

*Turkish*

| | |
|---|---|
| 48% 3:1 | 36.00-37.00† |

*Domestic*

Rail nearest seller

| | |
|---|---|
| 18% 3:1 | 30.00 |

**Molybdenum**

| | |
|---|---|
| Sulfide concentrate, per lb of Mo content, mines, unpacked | $1.23 |

**Antimony Ore**

Per short ton unit of Sb content, c.i.f. seaboard

| | |
|---|---|
| 50-55% | $2.50-2.75 |
| 60-65% | 2.80-3.20 |

**Vanadium Ore**

Cents per lb $V_2O_5$

| | |
|---|---|
| Domestic | 31.00 |

---

†Nominal.

# Metallurgical Coke

Price per net ton

**Beehive Ovens**

| | |
|---|---|
| Connellsville, Pa., furnace | $14.75-15.25 |
| Connellsville, Pa., foundry | 18.00-18.50 |

**Oven Foundry Coke**

| | |
|---|---|
| Birmingham, ovens | $30.35 |
| Cincinnati, deld. | 33.34 |
| Buffalo, ovens | 32.00 |
| Detroit, ovens | 32.00 |
| Pontiac, Mich., deld. | 33.95 |
| Saginaw, Mich., deld. | 35.53 |
| Erie, Pa., ovens | 32.00 |
| Everett, Mass., ovens: | |
| New England, deld. | 33.55* |
| Indianapolis, ovens | 31.25 |
| Ironton, Ohio, ovens | 30.50 |
| Cincinnati, deld. | 33.54 |
| Kearny, N. J., ovens | 31.25 |
| Milwaukee, ovens | 32.00 |
| Neville Island (Pittsburgh), Pa., ovens | 30.75 |
| Painesville, Ohio, ovens | 32.00 |
| Cleveland, deld. | 34.19 |
| Philadelphia, ovens | 31.00 |
| St. Louis, ovens | 33.00 |
| St. Paul, ovens | 31.25 |
| Chicago, deld. | 34.68 |
| Swedeland, Pa., ovens | 31.00 |
| Terre Haute, Ind., ovens | 31.25 |

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*Within $5.15 freight zone from works.

# Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

| | |
|---|---|
| Pure benzene | 31.00 |
| Xylene, industrial grade | 29.00 |
| Creosote | 24.00 |
| Naphthalene, 78 deg. | 5.00 |
| Toluene, one deg. (deld. east of Rockies) | 25.00 |

Cents per lb, f.o.b. tank cars or tank trucks, deld.

| | |
|---|---|
| Phenol, 90 per cent grade | 14.75 |

Per net ton bulk, f.o.b. cars or trucks, plant

| | |
|---|---|
| Ammonium sulfate, regular grade | $32.00 |

# Ferroalloys

## MANGANESE ALLOYS

**Spiegeleisen:** Carlot, 10 lb pigs, per gross ton, Palmerton, Pa. 21-23% Mn, $102.50, 19-21% Mn, 1-3% Si, $100; 16-19% Mn, $98. For Neville Island, Pa., prices add $2.50 as of Feb. 1. Lump, 35 lb and down: Deduct $2 from 10 lb pig prices at Palmerton.

**Standard Ferromanganese:** (Mn 74-76%, C 7% approx) base price per net tons, $220, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $228 per net ton, f.o.b. Anaconda, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

**High-Grade Low-Carbon Ferromanganese:** (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 4c for max 0.15% C grade from above prices, 5.3c for max 0.03% C, 6.6c for max 0.5% C, and 8.1c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

**Medium-Carbon Ferromanganese:** (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 24c per lb of contained Mn; packed, carload 25.3c, ton lot 26.9c, less ton 28.1c.

**Electrolytic Manganese Metal:** Min carload, bulk, 34.25c; 2000 lb to min carload 37c; less ton, 39c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

**Silicomanganese:** Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 11.6c per lb of alloy. Packed, c.l. 12.8c, ton 13.25c, less ton 14.25c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.3c from above prices. For 3% grade, Si 12.5-16%, deduct 0.5c from above prices. Spot, add 0.25c.

## TITANIUM ALLOYS

**Ferrotitanium, Low-Carbon:** (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

**Ferrotitanium, High-Carbon:** (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

**Ferrotitanium, Medium-Carbon:** (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

## CHROMIUM ALLOYS

**High-Carbon Ferrochrome:** C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

**Charge Chrome:** No. 1 (Cr 61-65%, C 5-7%, Si 5-8%), 22.00c.

**Blocking Chrome:** No. 1 (Cr 61-65%, C 5-7%, Si 5-8%), 22.00c; No. 2 (Cr 58-63%, C 5-6%, Si 8-10%), 23.00c; No. 3 (Cr 58-63%, C 5-6%, Si 10-12%), 23.00c.

**Refined Charge Chrome:** No. 1 (Cr 50-55%, C 5% max, Si 2% max), 25.00c; No. 2 (Cr 56-60%, C 5% max, Si 2% max), 25.00c.

**Low-Carbon Ferrochrome:** Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 35.75c per lb contained Cr; 0.010% max, 36.75c. Delivered.
Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

**Foundry Ferrochrome, High-Carbon:** (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

**Foundry Ferrosilicon Chrome:** (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload, bulk, 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c, less ton lot 23.70c. Delivered. Spot, add 0.25c.

**Ferrochrome-Silicon:** Cr 39-41%, Si 42-45%, C 0.05% max, 26.25c per lb contained Cr and 14.60c per lb contained Si; Cr 33-36%, Si 45-48%, C 0.05% max, 28.25c per lb contained Cr, 14.60c per lb contained Si; 0.75 in. x down, 29.40c per lb contained Cr, 14.60c per lb contained Si.

**Chromium Metal, Electrolytic:** Commercial grade (C 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

## VANADIUM ALLOYS

**Ferrovanadium:** Open hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

**Grainal:** Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

**Vanadium Oxide:** Contract, less carload lot, packed, $1.38 per lb contained $V_2O_5$, freight allowed. Spot, add 5c.

## SILICON ALLOYS

**50% Ferrosilicon:** Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

**Low-Aluminum 50% Ferrosilicon:** (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

**65% Ferrosilicon:** Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

**75% Ferrosilicon:** Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

**90% Ferrosilicon:** Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

**Silicon Metal:** (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

**Alsifer:** (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

## ZIRCONIUM ALLOYS

**12-15% Zirconium Alloy:** (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lots 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

**35-40% Zirconium Alloy:** (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

## BORON ALLOYS

**Ferroboron:** 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

**Borosil:** (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

**Carbortam:** (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

## CALCIUM ALLOYS

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

**Calcium-Silicon:** (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

## BRIQUETTED ALLOYS

**Chromium Briquets:** (Weighing approx 3⅛ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Ferromanganese Briquets:** (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 13.7c per lb of briquet; c.l., packed, bags 14.9c; 3000 lb to c.l., pallets 14.9c; 2000 lb to c.l., bags 16.1c; less ton 17c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicomanganese Briquets:** (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 14c per lb of briquet; c.l. packed, bags 15.2c; 3000 lb to c.l., pallets 15.2c; 2000 lb to c.l., bags 16.4c; less ton 17.3c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicon Briquets:** (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

**Molybdic-Oxide Briquets:** (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

**Titanium Briquets:** Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

## TUNGSTEN ALLOYS

**Ferrotungsten:** (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

## OTHER FERROALLOYS

**Ferrocolumbium:** (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

**Ferrotantalum Columbium:** (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

**Graphidox No. 4:** (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

**V-5 Foundry Alloy:** (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

**Simanal:** (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

**Ferrophosphorus:** (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

**Ferromolybdenum:** (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

**Technical Molybdic-Oxide:** Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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**OHIO MAGNET DEPENDABILITY**

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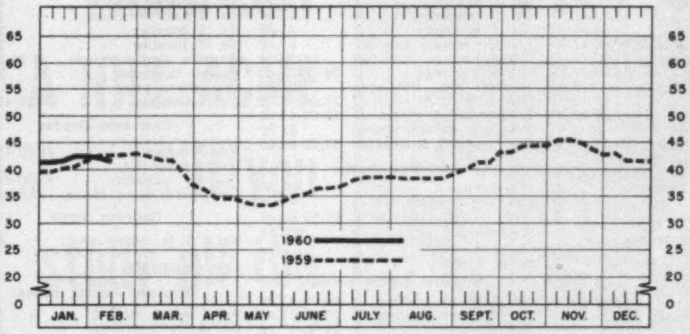
**STEELMAKING SCRAP PRICE COMPOSITE**

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania—Compiled by STEEL.



| Feb. 10 1960 | Week Ago | Month Ago | Year Ago | Jan. Avg. |
|---|---|---|---|---|
| $41.50 | $42.00 | $41.67 | $42.50 | $41.92 |

# Scrap Price Decline Is Extended

**STEEL's composite on No. 1 heavy melting grade drops another 50 cents a ton, now standing at $41.50. Mill buying support is still absent at most points**

Scrap Prices, Page 180

- **Chicago**—The recent softness in the scrap market has resulted in a drop of $1 to $2 a ton in the prices of most grades, steelmaking, blast furnace, and foundry material. A growing feeling that consumers' steel needs are being satisfied faster than had been anticipated appears to be back of the market easiness.

- **Philadelphia** — With domestic sales light and some easing in export demand noted, prices on most major grades of steel scrap have declined. No. 1 heavy melting is lower at $41, delivered, No. 2 heavy melting is $36, No. 1 bundles are quoted $45, No. 1 busheling $45, and electric furnace bundles $47, a decline of about $1 in the case of each grade. No. 2 bundles are unchanged, as are other grades of steel scrap. The cast grades are also steady, except for malleable which is nominally lower at $66.

- **New York**—Brokers' prices on the major open hearth grades are unchanged, but they are lower on various grades of borings and turnings. Machine shop turnings are $8-$10, off $2. Mixed borings and turnings are $12-$13, and short shoveling turnings are $13-$14, a drop of $1 in both items.

- **Pittsburgh**—Brokers for a mill on the fringe of the district paid dealers $43 for No. 1 heavy melting, delivered, ($1 more than last month) and $37 for No. 2 heavy melting (unchanged).

Prices later paid for railroad scrap gave further proof of the market's weakness. Most items on the Baltimore & Ohio and New York Central lists were 50 cents to $2 below last month's quotations.

Leading consumers have had firm offers of No. 2 bundles at $30. That's $2 less than they brought on the last big sale.

- **Cleveland**—The market here and in the Valley is off $2 to $4 a ton on the steelmaking and cast iron grades, brokers report. However, there have been no sales recently, and prices quoted are largely nominal.

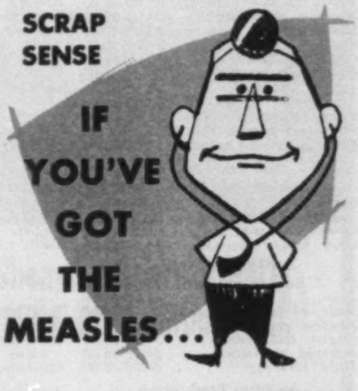
- **Buffalo**—The market appears to be moving sidewise. It lacks strength, though some purchasing is being done at the quoted prices.

- **Cincinnati** — The recent show of price strength was short-lived. Steelmaking grades last week dropped $1 a ton; No. 1 heavy melting is being quoted by brokers at $37-$38.

- **St. Louis**—The market is weaker, and a price drop of $1 to $3 a ton is expected on the open hearth grades. Material is moving in better volume. Considerable tonnage is coming into this market from Illinois, Iowa, and northern Missouri.

- **Birmingham** — Scrap is moving slowly at unchanged prices in this area. A fair volume of the cast iron grades is moving.

(*Please turn to Page* 185)



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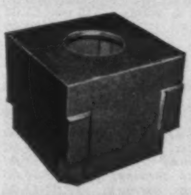
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# Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Feb. 10, 1960. *Changes shown in italics.*

### STEELMAKING SCRAP COMPOSITE

| | |
|---|---|
| Feb. 10 | $41.50 |
| Feb. 3 | 42.00 |
| Jan. Avg. | 41.92 |
| Feb. 1959 | 42.58 |
| Feb. 1955 | 36.79 |

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

---

### PITTSBURGH

| | |
|---|---|
| No. 1 heavy melting | 42.00-43.00 |
| No. 2 heavy melting | 36.00-37.00 |
| No. 1 dealer bundles | 44.00-45.00 |
| *No. 2 bundles* | *29.00-30.00* |
| No. 1 busheling | 42.00-43.00 |
| No. 1 factory bundles | 52.00-53.00 |
| Machine shop turnings | 23.00-24.00 |
| Mixed borings, turnings | 23.00-24.00 |
| Shovel turnings | 30.00-31.00 |
| Cast iron borings | 30.00-31.00 |
| Cut structurals: | |
| 2 ft and under | 50.00-51.00 |
| 3 ft and under | 49.00-50.00 |
| Heavy turnings | 35.00-36.00 |
| Punchings & plate scrap | 54.00-55.00 |
| Electric furnace bundles | 52.00-53.00 |

#### Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 50.00-51.00 |
| Stove plate | 46.00-47.00 |
| Unstripped motor blocks | 32.00-33.00 |
| Clean auto cast | 47.00-48.00 |
| *Drop broken machinery* | *55.00-56.00* |

#### Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt.* | *49.00-50.00* |
| *Rails, 2 ft and under* | *62.00-63.00* |
| *Rails, 18 in. and under* | *63.00-64.00* |
| *Random rails* | *59.00-60.00* |
| *Angles, splice bars* | *57.00-58.00* |
| *Railroad specialties* | *57.00-58.00* |
| *Rails, rerolling* | *64.00-65.00* |

#### Stainless Steel Scrap

| | |
|---|---|
| 18-8 bundles & solids | 230.00-235.00 |
| 18-8 turnings | 120.00-125.00 |
| 430 bundles & solids | 125.00-130.00 |
| 430 turnings | 55.00-65.00 |

### CHICAGO

| | |
|---|---|
| No. 1 hvy melt., indus. | 42.00-43.00 |
| *No. 1 hvy melt., dealer* | *39.00-40.00* |
| *No. 2 hvy melting* | *35.00-36.00* |
| *No. 1 factory bundles* | *43.00-44.00* |
| *No. 1 dealer bundles* | *40.00-41.00* |
| No. 2 bundles | 26.00-27.00 |
| No. 1 busheling, indus. | 42.00-43.00 |
| *No. 1 busheling, dealer* | *39.00-40.00* |
| *Machine shop turnings* | *21.00-22.00* |
| *Mixed borings, turnings* | *23.00-24.00* |
| *Shovel turnings* | *23.00-24.00* |
| *Cast iron borings* | *23.00-24.00* |
| *Cut structurals, 3 ft* | *48.00-49.00* |
| Punchings & plate scrap | 50.00-51.00 |

#### Cast Iron Grades

| | |
|---|---|
| *No. 1 cupola* | *53.00-54.00* |
| *Stove plate* | *49.00-50.00* |
| *Unstripped motor blocks* | *45.00-46.00* |
| *Clean auto cast* | *59.00-60.00* |
| *Drop broken machinery* | *59.00-60.00* |

#### Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt.* | *42.00-43.00* |
| *R.R. malleable* | *61.00-62.00* |
| *Rails, 2 ft and under* | *59.00-60.00* |
| *Rails, 18 in. and under* | *60.00-61.00* |
| *Angles, splice bars* | *53.00-54.00* |
| Axles | 59.00-60.00 |
| Rails, rerolling | 63.00-64.00 |

#### Stainless Steel Scrap

| | |
|---|---|
| 18-8 bundles, solids | 220.00-225.00 |
| 18-8 turnings | 115.00-120.00 |
| 430 bundles & solids | 115.00-120.00 |
| 430 turnings | 55.00-60.00 |

### DETROIT

(Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| *No. 1 heavy melting* | *35.00-36.00* |
| *No. 2 heavy melting* | *21.00-22.00* |
| *No. 1 bundles* | *38.00-39.00* |
| *No. 2 bundles* | *19.00-20.00* |
| *No. 1 busheling* | *34.00-35.00* |
| *Machine shop turnings* | *13.00-14.00* |
| *Mixed borings, turnings* | *12.00-13.00* |
| *Shovel turnings* | *11.00-12.00* |

#### Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 44.00-45.00 |
| Stove plate | 38.00-39.00 |
| Heavy breakable | 38.00-39.00 |
| Unstripped motor blocks | 30.00-31.00 |
| Charging box cast | 38.00-39.00 |
| Clean auto cast | 51.00-52.00 |

### CLEVELAND

| | |
|---|---|
| *No. 1 heavy melting* | *40.00-41.00* |
| *No. 2 heavy melting* | *30.00-31.00* |
| *No. 1 factory bundles* | *44.00-45.00* |
| *No. 1 bundles* | *40.00-41.00* |
| *No. 2 bundles* | *25.00-26.00* |
| *No. 1 busheling* | *40.00-41.00* |
| *Machine shop turnings* | *13.00-14.00* |
| *Shovel turnings* | *18.00-19.00* |
| *Mixed borings, turnings* | *18.00-19.00* |
| *Cast iron borings* | *18.00-19.00* |
| *Cut foundry steel* | *41.00-42.00* |
| *Cut structurals, plate 2 ft and under* | *48.00-49.00* |
| *Low phos. punchings & plate* | *42.00-43.00* |
| *Alloy free, short shovel turnings* | *20.00-21.00* |
| *Electric furnace bundles* | *42.00-43.00* |

#### Cast Iron Grades

| | |
|---|---|
| *No. 1 cupola* | *53.00-54.00* |
| *Charging box cast* | *39.00-40.00* |
| *Heavy breakable cast* | *39.00-40.00* |
| *Stove plate* | *47.00-48.00* |
| *Unstripped motor blocks* | *37.00-38.00* |
| Brake shoes | 39.00-40.00 |
| Clean auso cast | 56.00-57.00 |
| Burnt cast | 47.00-48.00 |
| *Drop broken machinery* | *54.00-55.00* |

#### Railroad Scrap

| | |
|---|---|
| *R.R. malleable* | *62.00-63.00* |
| *Rails, 2 ft and under* | *61.00-62.00* |
| *Rails, 18 in. and under* | *62.00-63.00* |
| *Rails, random lengths* | *55.00-56.00* |
| *Cast steel* | *51.00-52.00* |
| *No. 1 railroad cast* | *57.00-58.00* |
| *Railroad specialties* | *54.00-55.00* |
| *Angles, splice bars* | *54.00-55.00* |
| *Rails, rerolling* | *71.00-72.00* |

#### Stainless Steel

(Brokers' buying prices: f.o.b. shipping point)

| | |
|---|---|
| 18-8 bundles, solids | 210.00-215.00 |
| 18-8 turnings | 110.00-115.00 |
| 430 clips, bundles, solids | 115.00-120.00 |
| 430 turnings | 45.00-55.00 |

### YOUNGSTOWN

| | |
|---|---|
| *No. 1 heavy melting* | *43.00-44.00* |
| *No. 2 heavy melting* | *33.00-34.00* |
| *No. 1 busheling* | *43.00-44.00* |
| *No. 1 bundles* | *44.00-45.00* |
| *No. 2 bundles* | *28.00-29.00* |
| *Machine shop turnings* | *16.00-17.00* |
| *Shovel turnings* | *21.00-22.00* |
| *Cast iron borings* | *21.00-22.00* |
| *Low phos.* | *45.00-46.00* |
| *Electric furnace bundles* | *45.00-46.00* |

#### Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt.* | *45.00-46.00* |

### BUFFALO

| | |
|---|---|
| No. 1 heavy melting | 36.00-37.00 |
| No. 2 heavy melting | 33.00-34.00 |
| No. 1 bundles | 36.00-37.00 |
| No. 2 bundles | 27.00-28.00 |
| No. 1 busheling | 36.00-37.00 |
| Shovel turnings | 24.00-25.00 |
| Machine shop turnings | 20.00-21.00 |
| Cast iron borings | 22.00-23.00 |
| Low phos. structurals and plate, 2 ft and under | 45.00-46.00 |

#### Cast Iron Grades

(F.o.b. shipping point)

| | |
|---|---|
| No. 1 cupola | 47.00-48.00 |
| No. 1 machinery | 49.00-50.00 |

#### Railroad Scrap

| | |
|---|---|
| Rails, random lengths | 47.00-48.00 |
| Rails, 3 ft and under | 53.00-54.00 |
| Railroad specialties | 45.00-46.00 |

### CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| *No. 1 heavy melting* | *37.00-38.00* |
| *No. 2 heavy melting* | *31.00-32.00* |
| *No. 1 bundles* | *37.00-38.00* |
| *No. 2 bundles* | *26.00-27.00* |
| *No. 1 busheling* | *37.00-38.00* |
| *Machine shop turnings* | *20.00-21.00* |
| *Mixed borings, turnings* | *20.00-21.00* |
| *Shovel turnings* | *22.00-23.00* |
| Cast iron borings | 21.00-22.00 |
| Low phos. 18 in. | 49.00-50.00 |

#### Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 48.00-49.00 |
| *Heavy breakable cast* | *40.00-41.00* |
| Charging box cast | 41.00-42.00 |
| Drop broken machinery | 57.00-58.00 |

#### Railroad Scrap

| | |
|---|---|
| *No. 1 R.R. heavy melt.* | *42.00-43.00* |
| *Ralis, 18 in. and under* | *60.00-61.00* |
| *Rails, random lengths* | *51.00-52.00* |

### PHILADELPHIA

| | |
|---|---|
| *No. 1 heavy melting* | *41.00* |
| *No. 2 heavy melting* | *36.00* |
| *No. 1 bundles* | *45.00* |
| No. 2 bundles | 25.00 |
| *No. 1 busheling* | *45.00* |
| *Electric furnace bundles* | *47.00* |
| Mixed borings, turnings | 23.00† |
| Shovel turnings | 26.00-27.00 |
| Machine shop turnings | 23.00 |
| Heavy turnings | 31.00-35.00 |
| Structurals & plates | 47.00-49.00 |
| Couplers, springs, wheels | 51.00 |
| Rail crops, 2 ft & under | 66.00-68.00 |

#### Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 42.00 |
| Heavy breakable cast | 47.00 |
| Drop broken machinery | 54.00-55.00 |
| *Malleable* | *66.00†* |

### NEW YORK

(Brokers' buying prices)

| | |
|---|---|
| No. 1 neavy melting | 36.00-37.00 |
| No. 2 heavy melting | 32.00-33.00 |
| No. 1 bundles | 36.00-37.00 |
| No. 2 bundles | 20.00-21.00 |
| *Machine shop turnings* | *8.00-10.00* |
| *Mixed borings, turnings* | *12.00-13.00* |
| *Shovel turnings* | *13.00-14.00* |
| Low phos. structurals & plates | 39.00-40.00 |

#### Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 37.00-38.00 |
| Unstripped motor blocks | 25.00-26.00 |
| Heavy breakable | 37.00-38.00 |

#### Stainless Steel

| | |
|---|---|
| 18-8 sheets, clips, solids | 200.00-205.00 |
| 18-8 borings, turnings | 90.00-95.00 |
| 410 sheets, clips, solids | 55.00-60.00 |
| 430 sheets, clips, solids | 85.00-90.00 |

### BOSTON

(Brokers' buying prices; f.o.b. shipping point)

| | |
|---|---|
| *No. 1 heavy melting* | *35.00-36.00* |
| No. 2 heavy melting | 25.50-26.50 |
| No. 1 bundles | 35.00-36.00 |
| No. 1 busheling | 35.00-36.00 |
| Machine shop turnings | 12.00-13.00 |
| Shovel turnings | 16.00-17.00 |
| No. 1 cast | 39.00-40.00 |
| Mixed cupola cast | 36.00-36.50 |
| No. 1 machinery cast | 40.00-42.00 |

### BIRMINGHAM

| | |
|---|---|
| No. 1 heavy melting | 37.00-38.00 |
| No. 2 heavy melting | 31.00-32.00 |
| No. 1 bundles | 36.00-37.00 |
| No. 2 bundles | 25.00-26.00 |
| No. 1 busheling | 41.00-42.00 |
| Cast iron borings | 14.00-15.00 |
| Machine shop turnings | 24.00-25.00 |
| Shovel turnings | 25.00-26.00 |
| Bar crops and plate | 44.00-45.00 |
| Structurals & plate | 44.00-45.00 |
| Electric furnace bundles | 41.00-42.00 |
| Electric furnace: | |
| 3 ft and under | 40.00-41.00 |
| 2 ft and under | 39.00-40.00 |

#### Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 53.00-54.00 |
| Stove plate | 53.00-54.00 |
| Charging box cast | 29.00-30.00 |
| Unstripped motor blocks | 42.00-43.00 |
| No. 1 wheels | 45.00-46.00 |

#### Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt. | 39.00-40.00 |
| Rails, 18 in. and under | 57.00-58.00 |
| Rails, rerolling | 61.00-62.00 |
| Rails, random lengths | 53.00-54.00 |
| Angles, splice bars | 49.00-50.00 |

### ST. LOUIS

(Brokers' buying prices)

| | |
|---|---|
| No. 1 heavy melting | 36.00 |
| No. 2 heavy melting | 34.00 |
| No. 1 bundles | 42.00 |
| No. 2 bundles | 26.00 |
| No. 1 busheling | 42.00 |
| Machine shop turnings | 20.00 |
| Shovel turnings | 22.00 |

#### Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 53.00 |
| Charging box cast | 46.00 |
| Heavy breakable cast | 44.00 |
| Unstripped motor blocks | 45.00 |
| Clean auto cast | 56.00 |
| Stove plate | 46.00 |

#### Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt. | 44.00 |
| Rails, 18 in. and under | 54.00 |
| Rails, random lengths | 50.00 |
| Rails, rerolling | 61.00 |
| Angles, splice bars | 50.00 |

### HOUSTON

(Brokers' buying prices; f.o.b. cars)

| | |
|---|---|
| No. 1 heavy melting | 39.00 |
| No. 2 heavy melting | 36.00 |
| No. 1 bundles | 39.00 |
| No. 2 bundles | 25.00 |
| Machine shop turnings | 19.00-20.00 |
| Shovel turnings | 23.00 |
| Low phos, plate & structurals | 46.00-47.00† |

#### Cast Iron Grades

| | |
|---|---|
| *No. 1 cupola* | *44.00-45.00†* |
| *Heavy breakable* | *31.00* |
| *Foundry malleable* | *40.00-41.00†* |
| *Unstripped motor blocks* | *35.50-36.50* |

#### Railroad Scrap

| | |
|---|---|
| No. 1 R.R. heavy melt. | 39.00 |

### LOS ANGELES

(Brokers' buying prices)

| | |
|---|---|
| *No. 1 heavy melting* | *38.00* |
| *No. 2 heavy melting* | *35.00* |
| No. 1 bundles | 37.00 |
| *No. 2 bundles* | *18.00* |
| *Machine shop turnings* | *19.00* |
| Shovel turnings | 18.00 |
| Cast iron borings | 18.00 |
| Cut structurals and plate 1 ft and under | 48.00 |

#### Cast Iron Grades

| | |
|---|---|
| *No. 1 cupola* | *45.00-48.00* |

#### Railroad Scrap

| | |
|---|---|
| No. 1 R. R. heavy melt. | 39.00 |

### PORTLAND, OREG.

| | |
|---|---|
| No. 1 heavy melting | 37.00 |
| No. 2 heavy melting | 34.00 |
| No. 1 bundles | 34.00 |
| No. 2 bundles | 23.00 |
| Shovel turnings | 22.00 |
| Electric furnace bundles | 44.00-45.00 |

#### Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 40.00-42.00 |
| Heavy breakable | 35.00 |
| Unstripped motor blocks | 31.00 |
| Stove plate | 25.00 |

### SEATTLE

(Prepared, f.o.b. car)

| | |
|---|---|
| No. 1 heavy melting | 36.00 |
| No. 2 heavy melting | 34.00 |
| No. 1 bundles | 34.00 |
| No. 2 bundles | 20.00-22.00 |
| Machine shop turnings | 17.00† |
| Mixed borings, turnings | 17.00† |
| Electric furnace No. 1 | 45.00 |

#### Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 35.00 |
| Heavy breakable cast | 30.00 |
| Unstripped motor blocks | 25.00 |
| Stove plate (f.o.b. plant) | 21.00† |

### SAN FRANCISCO

| | |
|---|---|
| *No. 1 heavy melting* | *38.00* |
| *No. 2 heavy melting* | *34.00* |
| *No. 1 bundles* | *34.00* |
| No. 2 bundles | 22.00 |
| Machine shop turnings | 16.00 |
| Mixed borings, turnings | 16.00 |
| Cast iron borings | 16.00 |
| Heavy turnings | 16.00 |
| Shovel turnings | 16.00 |
| Cut structurals, 3 ft | 44.00 |

#### Cast Iron Grades

| | |
|---|---|
| No. 1 cupola | 46.00 |
| Charging box cast | 34.00 |
| Stove plate | 34.00 |
| Heavy breakable cast | 28.00 |
| Unstripped motor blocks | 31.00 |
| Clean auto cast | 40.00 |
| Drop broken machinery | 40.00 |
| No. 1 wheels | 34.00 |

### HAMILTON, ONT.

(Brokers' buying prices)

| | |
|---|---|
| No. 1 heavy melting | 32.25 |
| No. 2 heavy melting | 28.25 |
| No. 1 bundles | 32.25 |
| No. 2 bundles | 24.00 |
| Mixed steel scrap | 24.25 |
| Mixed borings, turnings | 13.00 |
| Busheling, new factory: | 13.00 |
| Prepared | 32.25 |
| Unprepared | 26.25 |
| Shovel turnings | 17.00 |

#### Cast Iron Grades‡

| | |
|---|---|
| No. 1 machinery cast | 46.50-48.00 |

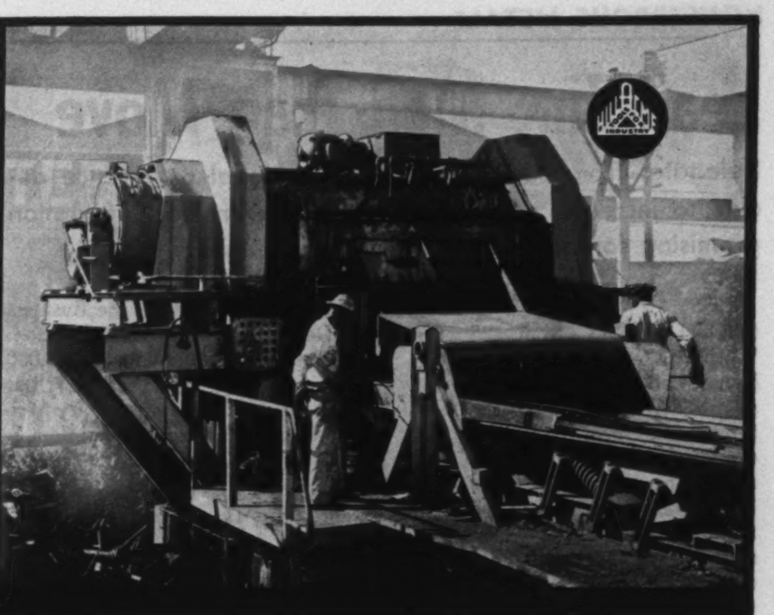
---

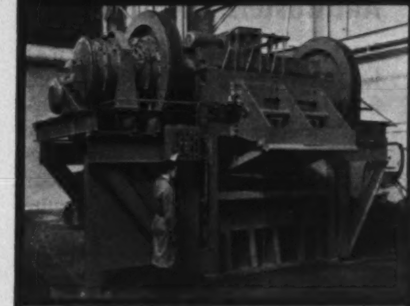
*Delivered to docks.

†Nominal.

‡F.o.b. Hamilton, Ont.

# You'll BUY A HILL ACME if you study all the facts!





## HILL ACME Rotary Scrap Shears prepare greater tonnage AT THE LOWEST POSSIBLE COST through:...

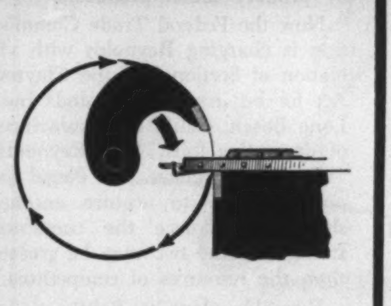
**HIGH SPEED OPERATION:**
12 cuts per minute with uninterrupted operation.

**CONTINUOUS FEEDING OF UNLIMITED LENGTHS:**
Shear production is in direct proportion to the feed-in conveyor's loading facilities.

**LOW MAINTENANCE:**
The simple mechanical motion of the HILL ACME ROTARY SHEAR involves no complicated assemblies requiring a factory trained trouble shooter.

**LESS DOWN TIME:**
Rotary shear knives are completely accessible for quick change and resetting. The possibility of "Wedging" is greatly reduced.

**LOWER KILOWATT HOUR COST OF OPERATION:**
*Compare the thirty day operating cost of a HILL ACME Rotary Scrap Shear with any other type of automatic shearing device: — We think you'll buy a HILL ACME.*



*Continuous, simple mechanical motion.*

**The HILL ACME Company**

*Also manufacturers of:* "CANTON" ALLIGATOR SHEARS • "HILL" HYDRAULIC SURFACE GRINDERS • GRINDING & POLISHING MACHINES • "ACME" FORGING • TAPPING MACHINES • "CLEVELAND" KNIVES AND SHEAR BLADES • MECHANICAL LIFTERS

**1201 West 65th St., Cleveland 2, Ohio**

# Lead-Zinc Men Plan Move

## Delegates from 25 nations at international conference decide to increase zinc output, hold back on lead. Situation promising for both metals. Prices more stable

**Nonferrous Metal Prices, Pages 184 & 185**

NEGOTIATORS from 25 Free World nations sat around a conference table at Geneva earlier this month. After evaluating the promising world market situation, they came up with a plan that has the solid support of most top-ranked U. S. lead and zinc men.

In a nutshell: Enough idle zinc capacity will be put back into operation this year to guarantee users an adequate supply. At the same time, lead output will be held down to keep stocks in line.

Although there are dissenters, the consensus is: The move is a timely one that alleviates the danger of an artificial zinc shortage. The delegates estimated that zinc consumption could exceed production by some 83,500 tons this year.

- **Lead's Different**—Lead will be handled differently. Consumption and mine production are about in balance, but heavy stocks overhang the market. So producers agreed to limit distribution. The projected effect is that supplies to the commercial markets over the first nine months will exceed demand by only 55,000 tons a year.

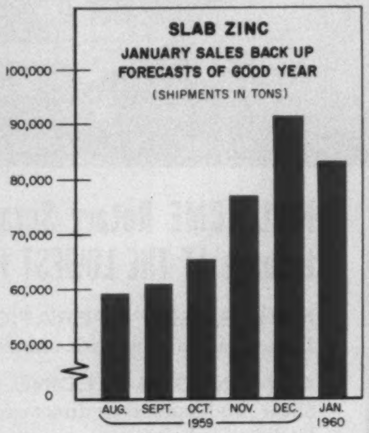
Part of the surplus comes from ores mined in 1959 that won't be converted into metal until this year because of strikes at some U. S. smelters last summer and fall. So ore stocks should drop in 1960.

- **What It Means** — The meeting brought out what everyone suspected —that zinc is in pretty good shape. But it also revealed: Statistically, lead is in a better position than many metalmen thought. It means: Prices this year should be stable to strong for both metals.

## More '59 Statistics

Production and sales figures continue to fortify earlier estimates that 1959 was a good year for many nonferrous metals despite strikes.

- **Aluminum**—Reports the Business & Defense Services Administration: Primary production hit 1,953,000 tons (excluding mill products); imports, 239,500 tons; secondary production, 456,000 tons. Total domestic availability in 1959 was 2,648,500 tons. In 1960, BDSA estimates it will be 2,880,000 tons.



Source: American Zinc Institute Inc.

- **Copper**—U. S. refined production, curtailed by the copper strike, dropped from 1,446,540 tons to 1,221,612 tons, reports the Copper Institute. But deliveries to fabricators rose to 1,312,412 tons compared with 1,179,416 tons in 1958.

- **Silver**—U. S. mine production fell 11 per cent to 30,344,426 ounces, reports the Bureau of Mines.

- **Lead**—Domestic mine production plummeted to 253,260 tons, the lowest level of the century.

## Phelps Dodge Settles

It shouldn't be long until virtually all the strikebound U. S. copper facilities are back in operation. Latest to sign: Phelps Dodge Corp., the nation's number two producer, which has negotiated an agreement with the union at all but one of its locations. Contract terms: Around 33 cents an hour over a 29 month period. The company won its fight for a strong "no strike" clause.

## Antitrusters Hit Reynolds

The government's antitrust hounds are pointing at another nonferrous company—this time Reynolds Metals Co. When the Justice Department slapped an antitrust action on Kennecott Copper last year for its acquisition of the Okonite Co., Washington insiders made no secret that a close watch was being kept on the acquisition of fabricators by primary metal producers.

Now the Federal Trade Commission is charging Reynolds with violation of Section 7 of the Clayton Act for buying Arrow Brands Inc., Long Beach, Calif., a manufacturer of decorative foils. Says Reynolds: "We do not believe it is illegal for one company to acquire another simply because the combined strength of the two may be greater than the resources of competitors."

Reynolds plans to fight!

### NONFERROUS PRICE RECORD

| | Feb. 10 Price | Last Change | Previous Price | Jan. Avg | Dec. Avg | Feb., 1959 Avg |
|---|---|---|---|---|---|---|
| Aluminum . | 26.00 | Dec. 17, 1959 | 24.70 | 26.000 | 25.300 | 24.700 |
| Copper .... | 33.00–35.00 | Dec. 23, 1959 | 33.00 | 34.000 | 33.269 | 30.159 |
| Lead ...... | 11.80 | Dec. 21, 1959 | 12.30 | 11.800 | 12.338 | 11.368 |
| Magnesium . | 35.25 | Aug. 13, 1956 | 33.75 | 35.250 | 35.250 | 35.250 |
| Nickel ..... | 74.00 | Dec. 6, 1956 | 64.50 | 74.000 | 74.000 | 74.000 |
| Tin ........ | 101.25 | Feb. 10, 1960 | 100.875 | 99.875 | 99.130 | 102.364 |
| Zinc ....... | 13.00 | Jan. 8, 1960 | 12.50 | 12.917 | 12.500 | 11.409 |

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. customer custody; MAGNESIUM, pig 99.8%, Velasco, Tex.

WATER
Bob Bugg

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**VANADIUM**
**CORPORATION OF AMERICA**
**Producers of alloys, metals and chemicals**

# Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

## PRIMARY METALS AND ALLOYS

**Aluminum:** 99.5%, pigs, 26.00; ingots, 28.10, 30,000 lb or more, f.o.b. customer custody.

**Aluminum Alloy:** No. 13, 29.90; No. 43, 29.70; No. 195, 30.70; No. 214, 31.50; No. 356, 28.60, 30 lb ingots; 10 lb ingots, add 0.4 cent per lb; 6 lb ingots, add 0.6 cent per lb.

**Antimony:** R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 25.00-26.00, New York, duty paid, 10,000 lb or more.

**Beryllium:** 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

**Beryllium Aluminum:** 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

**Beryllium Copper:** 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

**Bismuth:** $2.25 per lb, ton lots.

**Cadmium:** Sticks and bars, $1.50 per lb deld.

**Cobalt:** 99+%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

**Columbium:** Powder, $55-85 per lb nom.

**Copper:** Electrolytic, 33.00 deld.; custom smelters, 35.00; lake, 33.00 deld.; fire refined, 32.75 deld.

**Germanium:** First reduction, ingots, less than 1 kg, 36.00-37.50 per gram; 1-10 kg, 30.50-32.00 per gram; 10 kg or more, 28.10-29.99 per gram; intrinsic grade, under 10 kg, 31.95 per gram; 10 kg or more, 29.95 per gram.

**Gold:** U. S. Treasury, $35 per oz.

**Indium:** 99.9%, $2.25 per troy oz.

**Iridium:** $70-75 per troy oz nom.

**Lead:** Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis. New York basis, add 0.20.

**Lithium:** 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

**Magnesium:** Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 1.3 in. diam. x 12 in. sticks, 57.00 f.o.b. Madison, Ill.

**Magnesium Alloy:** AZ91A (diecasting), 40.75; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

**Mercury:** Open market, spot, New York, $210-212 per 75 lb flask.

**Molybdenum:** Unalloyed forging billets, 4.125-7.0 in. diam., 50-4999 lb, $8.15-11.50 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

**Nickel:** Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, in kegs, 74.50; "F" nickel, 5 lb ingots, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

**Osmium:** $70-90 per troy oz nom.

**Palladium:** $24-26 per troy oz.

**Platinum:** $82-85 per troy oz from refineries.

**Radium:** $16-21.50 per mg radium content, depending on quantity.

**Rhodium:** $137-140 per troy oz.

**Ruthenium:** $45-50 per troy oz.

**Selenium:** $7 per lb, commercial grade.

**Silver:** Open market, 91.375 per troy oz.

**Sodium:** Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

**Tantalum:** Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

**Tellurium:** $3.00 per lb.

**Thallium:** $7.50 per lb.

**Tin:** Straits, N. Y., spot, 101.25; prompt, 101.00.

**Titanium:** Sponge, 99.3+% grade A-1, ductile (0.3% Fe max.), $1.60 per lb; grade A-2 (0.5% Fe max.), $1.50 per lb.

**Tungsten:** Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $3.50-4.25.

**Zinc:** Prime western, 13.00; brass special 13.25; intermediate, 13.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 14.25; special high grade, 14.50 deld. Diecasting alloy ingot No. 3, 16.50; No. 2, 17.00; No. 5, 16.75 deld.

**Zirconium:** Reactor grade sponge, 100 lb or less, $8 per lb; 100-500 lb, $7 per lb; over 500 lb, $6.50 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

## SECONDARY METALS AND ALLOYS

**Aluminum Ingot:** Piston alloys, 27.25-29.00; No. 12 foundry alloy (No. 2 grade), 25.00-25.25; 5% silicon alloy, 0.60 Cu max., 26.25; 13 alloy, 0.60 Cu max., 26.25; 195 alloy, 28.00-28.75; 108 alloy, 25.50-25.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.50; grade 2, 24.25; grade 3, 23.25; grade 4, 22.75.

**Brass Ingot:** Red brass, No. 115, 30.75; tin bronze, No. 225, 41.50; No. 245, 36.00; high-leaded tin bronze, No. 305, 35.25; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 29.25.

**Magnesium Alloy Ingot:** AZ63A, 37.50; AZ91B, 37.25; AZ91C, 41.25; AZ92A, 37.50.

## NONFERROUS PRODUCTS

### BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.975, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.955, f.o.b. Temple, Pa.

### COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 38.35; l.c.l., 38.98. Weatherproof, 20,000-lb lots, 38.55; l.c.l., 39.30.

### LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

### TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.55-9.50; forging billets, $3.20-4.75; hot-rolled and forged bars, $4.00-6.25.

### ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 28.00; ribbon zinc in coils, 22.50; plates, 21.50.

### ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

### NICKEL, MONEL, INCONEL

| | "A" Nickel | Monel | Inconel |
|---|---|---|---|
| Sheets, C.R. | 138 | 120 | 138 |
| Strip, C.R. | 124 | 108 | 138 |
| Plate, H.R. | 130 | 110 | 126 |
| Rod, Shapes, H.R. | 107 | 89 | 109 |
| Seamless Tubes | 157 | 129 | 200 |

### ALUMINUM

(Selected products and sizes)

**Flat Sheets:** 1100, 3003, and 5005, mill finish, 30,000 lb base, f.o.b. customer custody.

| Thickness Range (in.) | Widths (in.) | Length Range (in.) | Price Range |
|---|---|---|---|
| 0.250-0.136 | 24–72 | 72–180 | 45.10-47.70 |
| 0.136-0.096 | 24–72 | 72–180 | 45.50-48.70 |
| 0.096-0.077 | 24–72 | 72–180 | 46.20-50.00 |
| 0.077-0.068 | 24–72 | 72–180 | 46.70-51.70 |
| 0.068-0.061 | 24–72 | 72–180 | 46.70-55.00 |
| 0.061-0.048 | 24–72 | 72–180 | 47.30-57.30 |
| 0.048-0.038 | 24–72 | 72–180 | 47.80-60.20 |
| 0.038-0.030 | 24–72 | 72–180 | 48.20-65.30 |
| 0.030-0.024 | 24–60 | 72–180 | 48.70-56.60 |
| 0.024-0.019 | 24–60 | 72–180 | 49.40-59.90 |
| 0.019-0.017 | 24–48 | 72–144 | 50.30-57.00 |
| 0.017-0.015 | 24–48 | 72–144 | 51.20-58.00 |
| 0.015-0.014 | 24–36 | 72–144 | 52.30 |
| 0.014-0.012 | 24–36 | 72–144 | 53.50 |
| 0.012-0.011 | 24–36 | 72–144 | 54.60 |
| 0.011-0.0095 | 24–36 | 72–144 | 56.20 |
| 0.0095-0.0085 | 24–36 | 72–96 | 57.50 |
| 0.0085-0.0075 | 24–36 | 72–96 | 59.20 |
| 0.0075-0.007 | 24–36 | 72–96 | 60.80 |
| 0.007-0.006 | 24–36 | 72–96 | 62.50 |

### ALUMINUM (continued)

**Plates and Circles:** Thickness, 0.25-3 in.; width or diam., 24-60 in.; lengths, 72-240 in., mill finish.

| Alloy | Plate Base | Circle Base |
|---|---|---|
| 1100-F, 3003-F | 44.60 | 49.40 |
| 5050-F | 45.70 | 50.50 |
| 3004-F | 46.70 | 52.40 |
| 5052-F | 47.30 | 53.10 |
| 6061-T6 | 47.80 | 53.90 |
| 2024-T4 | 51.80 | 58.90 |
| 7075-T6* | 60.50 | 67.90 |

---

*24-48 in. width or diam., 72-180 in. lengths.

**Screw Machine Stock:** 30,000 lb base, 12 ft lengths.

| Diam. | ——Round—— | | —Hexagonal— | |
|---|---|---|---|---|
| (in.)* | 2011-T3 | 2017-T4 | 2011-T3 | 2017-T4 |
| 0.125 | 72.90 | 75.80 | .... | .... |
| 0.188 | .... | .... | .... | 78.20 |
| 0.250 | 58.00 | 61.60 | 70.70 | 72.30 |
| 0.375 | 57.20 | 62.40 | 69.00 | 70.50 |
| | 2011-T3 | 2017-T451 | 2011-T3 | 2017-T451 |
| 0.500 | 57.20 | 62.40 | 69.00 | 70.50 |
| 0.625 | 57.20 | 62.40 | 65.80 | 66.60 |
| 0.750 | 55.70 | 60.70 | 59.60 | 62.60 |
| 0.875 | 55.70 | 60.70 | 59.60 | 62.60 |
| 1.000 | 55.70 | 60.70 | 59.60 | 62.60 |
| 1.125 | 53.30 | 58.30 | 57.50 | 60.40 |
| 1.250 | 53.30 | 58.30 | 57.50 | 60.40 |
| 1.375 | 53.30 | 58.30 | 57.50 | 60.40 |
| 1.500 | 53.30 | 58.30 | 57.50 | 60.40 |
| 1.625 | 51.00 | 55.60 | .... | 58.20 |
| 1.750 | 51.00 | 55.60 | 56.30 | 58.20 |
| 1.875 | 51.00 | 55.60 | .... | 58.20 |
| 2.000 | 51.00 | 55.60 | 56.30 | 58.20 |
| 2.250 | 49.50 | 54.00 | .... | 58.20 |
| 2.500 | 49.50 | 54.00 | .... | 58.20 |
| 2.750 | 47.90 | 52.20 | .... | 58.20 |
| 3.000 | 47.90 | 52.20 | .... | 58.20 |
| 3.250 | .... | 52.20 | .... | .... |
| 3.375 | .... | 52.20 | .... | .... |

---

*Selected sizes.

**Forging Stock:** Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 47.20-56.90; 6061, 43.20-56.90; 7075, 61.50-71.20; 7079, 66.50-76.20.

**Pipe:** ASA schedule 40, alloy 6063-T6, 3-40 ft. lengths, plain ends, 90,000 lb base, dollars per ft. Nominal pipe sizes: 1 in., 31.55; 1¼ in., 42.75; 1½ in., 51.05; 2 in., 61.70; 3 in., 123.40; 4 in., 169.55; 5 in., 229.60; 6 in., 304.60; 8 in., 458.40; 10 in., 706.45 (3-24 ft. lengths).

**Extruded Solid Shapes:**

| Factor | Alloy 6063-T5 | Alloy 6062-T6 |
|---|---|---|
| 1-14 | 44.70-46.20 | 53.20-59.00 |
| 15-17 | 44.70-46.20 | 55.60-60.80 |
| 18-23 | 45.20-46.80 | 57.70-66.40 |
| 24-32 | 45.20-46.80 | 65.60-78.80 |
| 33-38 | 48.80-51.40 | 82.30-93.40 |
| 39-44 | 58.70-62.40 | 99.90-121.00 |

### MAGNESIUM

**Sheets and Plate:** AZ31B standard grade, .032 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.00 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

**Extruded Solid Shapes:**

| Factor | Com. Grade (AZ31C) | Spec. Grade (AZ31B) |
|---|---|---|
| 6-8 | 65.30-67.60 | 84.60-87.40 |
| 12-14 | 65.30-67.60 | 85.70-88.00 |
| 24-26 | 66.10-68.40 | 90.60-91.30 |
| 36-38 | 71.50-75.30 | 104.20-105.30 |

## NONFERROUS SCRAP

### DEALERS' BUYING PRICES

**Copper and Brass:** No. 1 heavy copper and wire, 25.75-26.25; No. 2 heavy copper and wire, 22.75-23.25; light copper, 21.25-21.75; No. 1 composition red brass, 18.75-19.25; No. 1 com-

## BRASS MILL PRICES

| | MILL PRODUCTS a | | | | SCRAP ALLOWANCES e (Based on copper at 33.00c) | | |
|---|---|---|---|---|---|---|---|
| | Sheets, Strip, Plate | Rod | Wire | Seamless Tubes | Clean Heavy | Rod Ends | Clean Turnings |
| Copper | 57.13b | 54.86c | .... | 58.32 | 29.000 | 29.000 | 28.250 |
| Yellow Brass | 50.57 | 36.06d | 50.86 | 54.23 | 22.250 | 21.250 | 20.250 |
| Low Brass, 80% | 53.53 | 53.22 | 53.82 | 57.09 | 24.750 | 24.500 | 24.000 |
| Red Brass, 85% | 54.58 | 54.27 | 54.87 | 58.14 | 25.750 | 25.500 | 25.000 |
| Com. Bronze, 90% | 56.17 | 55.86 | 56.46 | 59.48 | 26.750 | 26.500 | 26.000 |
| Manganese Bronze | 58.86 | 52.21 | 62.69 | .... | 20.875 | 20.625 | 19.875 |
| Muntz Metal | 53.20 | 48.26 | .... | .... | 20.875 | 20.625 | 20.125 |
| Naval Brass | 55.12 | 48.68 | 61.43 | 58.78 | 20.750 | 20.500 | 20.000 |
| Silicon Bronze | 62.86 | 61.80 | 62.15 | 80.79 | 28.375 | 28.125 | 27.375 |
| Nickel Silver, 10% | 65.98 | 68.06 | 68.06 | .... | 26.875 | 26.625 | 14.937 |
| Phos. Bronze | 77.44 | 78.19 | 77.69 | 79.37 | 29.875 | 29.625 | 28.625 |

a. Cents per lb, f.o.b. mill; freight allowed on 50 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 17.25-17.50; new brass clippings, 15.50-16.00; light brass, 12.00-12.25; heavy yellow brass, 13.25-13.75; new brass rod ends, 13.25-13.75; auto radiators, unsweated, 14.75-15.25; cocks and faucets, 15.25-15.75; brass pipe, 15.25-15.75.

**Lead:** Soft scrap lead, 8.00-8.25; battery plates, 3.00-3.25; linotype and stereotype, 9.00-9.50; electrotype, 7.25-7.75; mixed babbitt, 9.50-10.00.

**Monel:** Clippings, 28.00-29.00; old sheets, 24.00-26.00; turnings, 20.00-22.00; rods, 28.00-29.00.

**Nickel:** Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

**Zinc:** Old zinc, 4.50-5.00; new diecast scrap, 4.25-4.50; old diecast scrap, 2.75-3.00.

**Aluminum:** Old castings and sheets, 11.00-11.50; clean borings and turnings, 7.00-7.50; segregated low copper clips, 15.00-15.50; segregated high copper clips, 14.00-14.50; mixed low copper clips, 14.50-15.00; mixed high copper clips, 12.50-13.00.

(Cents per pound, Chicago)

**Aluminum:** Old castings and sheets, 12.75-13.25; clean borings and turnings, 10.00-10.50; segregated low copper clips, 16.75-17.25; segregrated high copper clips, 16.00-16.50; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.50-16.00.

(Cents per pound, Cleveland)

**Aluminum:** Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

### REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

**Beryllium Copper:** Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 59.00; light scrap, 54.00; turnings and borings, 39.00.

**Copper and Brass:** No. 1 heavy copper and wire, 27.50; No. 2 heavy copper and wire, 25.75; light copper, 23.50; refinery brass (60% copper) dry copper content, 24.25.

### INGOTMAKERS' BUYING PRICES

**Copper and Brass:** No. 1 heavy copper and wire, 27.50; No. 2 heavy copper and wire, 25.75; light copper, 23.50; No. 1 composition borings, 22.00; No. 1 composition solids, 22.50; heavy yellow brass solids, 16.50; yellow brass turnings, 15.50; radiators, 17.50.

## PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

### ANODES

**Cadmium:** Special or patented shapes, $1.50.

**Copper:** Flat-rolled, 50.04; oval, 48.00; 5000-10,000 lb; electrodeposited, 42.50; 2000-5000 lb lots; cast, 45.00, 5000-10,000 lb quantities.

**Nickel:** Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29.999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

**Tin:** Bar or slab, less than 200 lb, 119.50; 200-499 lb, 118.00; 500-999 lb, 117.50; 1000 lb or more, 117.00.

**Zinc:** Balls, 20.50; flat tops, 20.50; flats, 23.25; ovals, 22.50, ton lots.

### CHEMICALS

**Cadmium Oxide:** $1.40 per lb in 100-lb drums.

**Chromic Acid (flake):** 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10.000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

**Copper Cyanide:** 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

**Copper Sulphate:** 100-1900 lb, 16.00; 2000-5900 lb, 14.00; 6000-11,900 lb, 13.75; 12,000-22,900 lb, 13.50; 23,000 lb or more, 13.00.

**Nickel Chloride:** 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

**Nickel Sulphate:** 5000-22,999 lb, 29.00; 23,000-39,900 lb, 28.50; 40,000 lb or more, 28.00.

**Sodium Cyanide (Cyanobrik):** 200 lb, 23.80; 400-800 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.

**Sodium Stannate:** Less than 100 lb, 79.10; 100-600 lb, 69.70; 700-1900 lb, 67.00; 2000-9900 lb, 65.10; 10,000 lb or more, 63.80.

**Stannous Chloride (Anhydrous):** 25 lb, 154.40; 100 lb, 149.50; 400 lb, 147.10; 800-19,900 lb, 106.20; 20,000 lb or more, 100.10.

**Stannous Sulphate:** Less than 50 lb, 139.60; 50 lb, 109.60; 100-1900 lb, 107.60; 2000 lb or more, 105.60.

**Zinc Cyanide:** 100-200 lb, 59.00; 300-900 lb, 57.00.

*(Concluded from Page 179)*

● **Houston**—Activity is limited in the face of restricted domestic and export demand. Brokers quickly covered the modest February purchase of the Lone Star mill. Prices on the East Texas mill order were unchanged from those in January, except for No. 2 heavy melting, which went up $1 a ton.

● **Seattle**—No change in prices is expected until next month. The market is inactive, larger consumers buying spasmodically, and in small volume.

● **Los Angeles**—The price of No. 1 heavy melting steel is off $2 a ton, being quoted at $38. Lack of buying by the mills is reflected in tighter specifications, particularly on bundled material. Auto wrecking is at a standstill.

● **San Francisco**—Prices on the top grades of steelmaking scrap have been marked down $2 a ton. Export sales are holding up.

## Consumer's Scrap Stocks Set Record During Strike

While over-all consumption of scrap declined during the steel strike, the percentage of purchased material received by all types of consumers increased, reports the Institute of Scrap Iron & Steel Inc. in a study of the first monthly (October, 1959) statistical report on scrap issued since the start of the strike last July.

The data show consumers' stocks (home and purchased) increased in the strike period. Steel mill supplies, for example, went up 453,000 tons, while foundries and others increased their holdings by 122,000. As of Oct. 31, consumers' stocks were 8,790,755 tons, highest on record.

During the strike, purchased scrap consumption averaged 1,319,000 gross tons monthly, contrasting with 2,517,000 monthly in the preceding January-June period. Despite the 85 per cent drop in steelmaking, scrap use did not decline to the same extent.

Exports in 1959 totaled 4,346,000 tons vs. 2,686,520 in 1958 and 5,921,149 in 1957.

FOR SALE
LIQUIDATION PRICES
BARGAINS

80—All Steel Open Hearth Charging Cars 6'8" x 8'2"

2—25 ton Ladles

Phone—Wire—Write

HYMAN-MICHAELS COMPANY
108 N. State St. Chicago 2, Ill.
Phone: DEarborn 2-5422

FOR SALE

1 Mill Type Bldg. 600'0 x 78'0 with 25-5 Ton Overhead Crane, 65'0 cc of Rails, Lift 50'0.

1 Mill Type Bldg. 382'0 x 67'0 with 15 Ton Crane, 65'0 cc of Rails, Lift 47'0.

1 Crane Runway 500'0 x 55'0 with 15 Ton Overhead Crane, 50'0 cc of Rails, Lift 47'0.

Will sell all or part.

Reply Box 795, STEEL
Penton Bldg. Cleveland 13, Ohio

## CLASSIFIED

### Representatives Wanted

SALES REPRESENTATIVE—Long established producer of metal abrasives requires Manufacturers agent for Ontario, Canada area. Also representation for Philadelphia-New Jersey area. Prefer individuals now contacting foundries, forge, steel & heat treating plants. Address: Reply to Box 825, STEEL, Penton Bldg., Cleveland 13, Ohio. State experience and present activity. Personal interview will be arranged.

### Help Wanted

FOUNDRY METALLURGIST—Modern, well established steel and gray iron foundry, located in Rochester, New York, has immediate opening for a metallurgist. Must be capable of taking complete charge of metallurgy and melting department, operating two electric furnaces of one-, and two-ton capacity. The Company offers liberal benefits, including a profit-sharing plan. Please provide complete background in first letter, including references and salary desired. Reply Box 826, STEEL, Penton Bldg., Cleveland 13, Ohio.

WANTED—DESIGN ENGINEER—Well established manufacturer of gas-fired industrial heat treating equipment and appliances desires a designer and engineer with at least ten years experience with similar company. Must be an experienced draftsman capable of supervising drafting and engineering department. Send resume of education, experience, also salary requirements and references to Box 829, STEEL, Penton Bldg., Cleveland 13, Ohio.

### Positions Wanted

FACTORY MANAGER OR SUPT.: Familiar all mfg. phases of mass produced sheet metal products, also wide experience fabricating process equipment, tanks, etc. all metals. Capable complete shop management, labor relations, tooling, welding, painting, plant layout, maintenance, methods, costs, etc. Complete details at interview. Reply Box 828, STEEL, Penton Bldg., Cleveland 13, Ohio.

FOR CLASSIFIED RATES
And Further information write
STEEL, Penton Bldg., Cleveland 13, O.

Announcing . . .

New Production Capacity
To Serve You
Better

Large Generated Gears

SPUR—HERRINGBONE—HELICAL

*for a wide range of industrial applications*

Gears which must operate smoothly and without vibration at higher speeds and under greater loads must correspondingly be more accurate in tooth profile and spacing.

H & S Generated Gears provide these results.

To meet increasing customer demands, Horsburgh & Scott has broadened its manufacturing capacity and tooled to produce *large* Generated Gears up to 125" diameter.

Offering the same high quality standards which characterize the complete H & S Gear line, production capacities for large Spur, Helical and Hobbed-Herringbone Gears are now available in the following dimensions:

Up to 80" outside diameter at 1 DP
Up to 90" outside diameter at 1¼ DP
Up to 100" outside diameter at 1½ DP
Up to 125" outside diameter at 2 DP

Face widths up to 42", depending on helix angle.

Take advantage of this new capacity, and our long experience as specialists in this field. Send your specifications, drawings or plans — or tell us about your power transmission problem. Our technical staff will promptly consider your requirements and render recommendations and quotations.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 Hamilton Avenue • Cleveland 14, Ohio

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MR. RED CIRCLE
RED CIRCLE
Rolls
ALLOY-CHILLED

Red
CIRCLE ROLLS
*for every purpose*

Uniform performance, high production and long service are unfailing characteristics of these better rolls.

Preferred by leading mills throughout the nation for more than half a century.

*Yes, there's a Red Circle Roll for every purpose.*

**ROLLS**

Nickel Alloy Grain Rolls
Grain Rolls
Chilled Rolls
Nickel Chilled Rolls
Moly Rolls
Nodular Iron Rolls

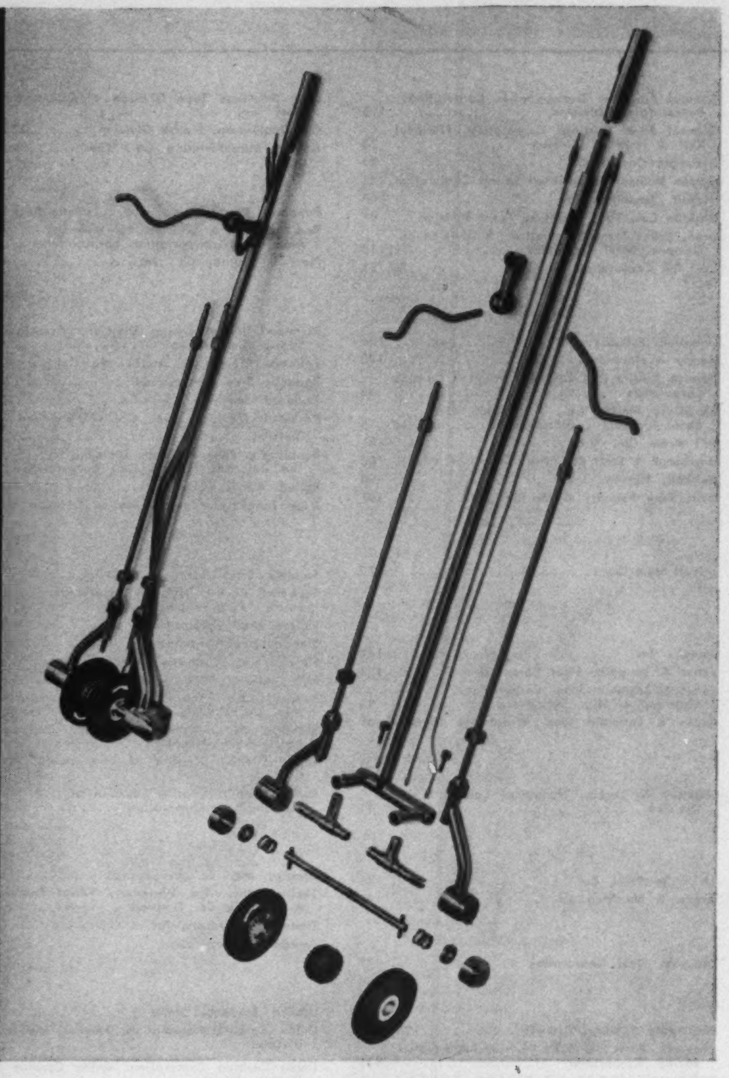
All Grades Nickel Alloy Iron Rolls for Hot and Cold Rolling

Hyde Park
FOUNDRY and
MACHINE CO.
HYDE PARK
Westmoreland County, Pa.

**Rolls**
**Rolling Mill Equipment**
**Gray Iron Castings**

# HERE'S HOW STILL ANOTHER MANUFACTURER JOINS STAINLESS STEEL TUBING:

*He uses Handy & Harman's BRAZE 630*



He's one of many manufacturers and fabricators who have found—to their lasting satisfaction—that Handy & Harman silver alloy brazing is the final answer to stainless steel joining problems.

Super-Donic Manufacturing Company, Atlanta, Georgia, manufactures "Dual Arm Transmissions" for the dental industry. Most everybody has—at one time or another—seen and/or felt this unit in operation.

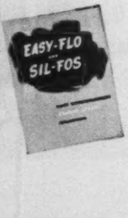
It is fabricated of small diameter 304 and 316 stainless steel tubing and, in its assembled form, consists of some 17 separate brazed joints. Joints must be strong, corrosion resistant and neat-appearing.

Each of the 17 joints is hand-torch brazed with Handy & Harman BRAZE 630 wire and HANDY FLUX TYPE B-1. There's no question that this is a unique application. There's no question, either, that the application is stainless steel. The ease and economy with which this manufacturer solves his problems can be just as readily applied to *your* stainless steel joining problems.

Strength, production speed, electrical and thermal conductivity, gas and liquid tightness and low cost are *natural* benefits of silver alloy brazing. We think it worth your while to learn more about this remarkable metal-joining method—we'll be glad to send you any information you ask for. Handy & Harman, 82 Fulton St., New York 38, N. Y.

**FOR A GOOD START:**
**BULLETIN 20**

This informative booklet gives a good picture of silver brazing and its benefits . . . includes details on alloys, heating methods, joint design and production techniques. Write for your copy.



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General Offices: 82 Fulton St., New York 38, N.Y.

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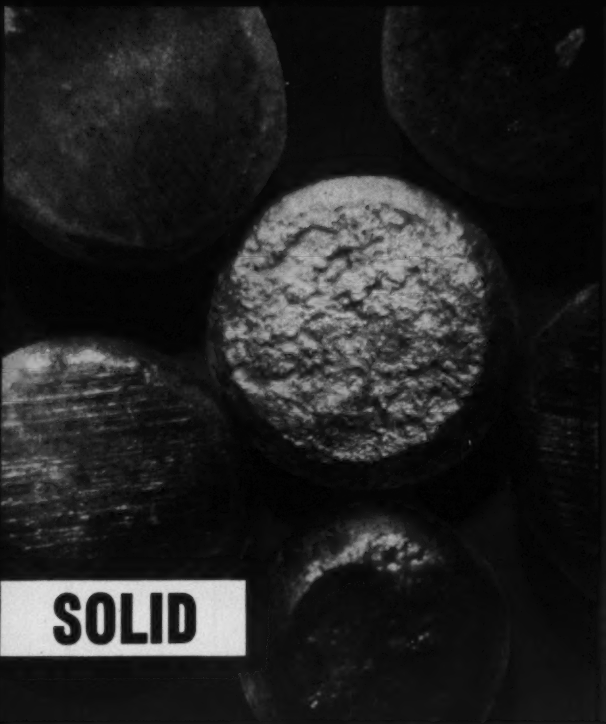
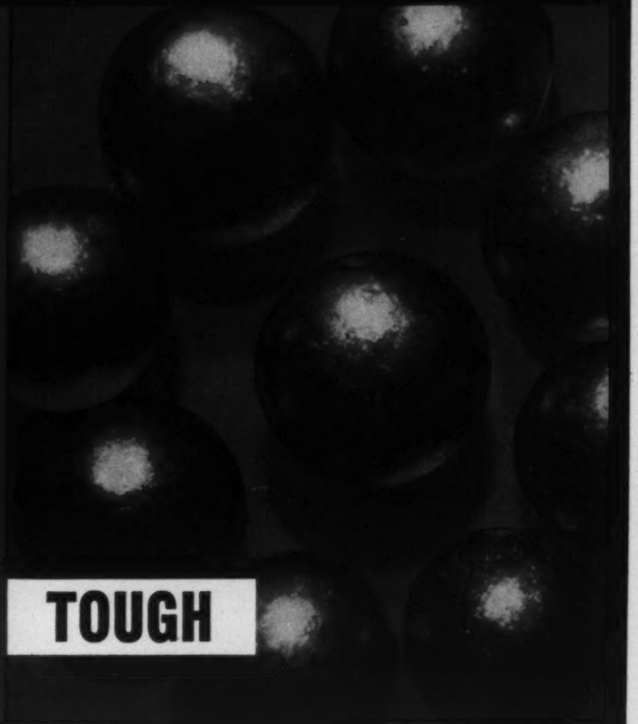
Montreal, Canada
Toronto, Canada

NOW ROTOBLAST STEEL SHOT
PROVES IT CUTS ABRASIVE COSTS!





**Rotoblast Steel Shot has already stacked up an impressive record of reduced costs in foundries* and blast cleaning departments* from coast to coast!**

- Atlantic Coast steel foundry—Compared with premium abrasive formerly used, Rotoblast Steel Shot cuts abrasive costs *in half*—and gives better cleaning than before!
- Southwestern manufacturing company—Now uses 7 lbs. of Rotoblast Shot per wheel hour, compared to 23 lbs. of malleable shot previously used!
- Large automotive foundry—Rotoblast Shot consumption 30% less than other steel shot tested; cleans castings faster!
- Eastern steel plant—Now uses Rotoblast Shot to descale steel strip, after exacting lab tests proved it better than previous steel abrasives!
- Midwest forge shop—Found Rotoblast Shot reduced abrasive costs 23% below that of abrasives previously used!
- Steel tank company—Cut cleaning costs in half (from 4c to 2c per sq. ft.) when it switched to Rotoblast Steel Shot.

These examples are just some of the many proving Rotoblast's cost-cutting qualities! Arrange a trial in your plant! Talk to your Pangborn man or write PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Maryland. *Manufacturers of Blast Cleaning and Dust Control Equipment—Rotoblast Steel Shot and Grit.* ®

**Names available on request*

Pangborn
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STEEL SHOT

Pangborn

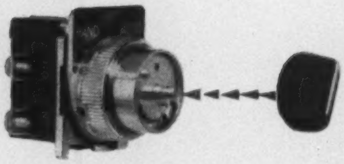
ROTOBLAST®
STEEL SHOT & GRIT

# NEW
# COLOR-CODED
# CONTROL STATIONS
*by Cutler-Hammer*

Now Cutler-Hammer 10250T Oil-Tight Control Units permit color-coding of your machine control stations and operator panels. New selector switches feature interchangeable colored operating knobs that match the six distinctive colors of Cutler-Hammer's Oil-Tight Pushbuttons and Indicating Lights.

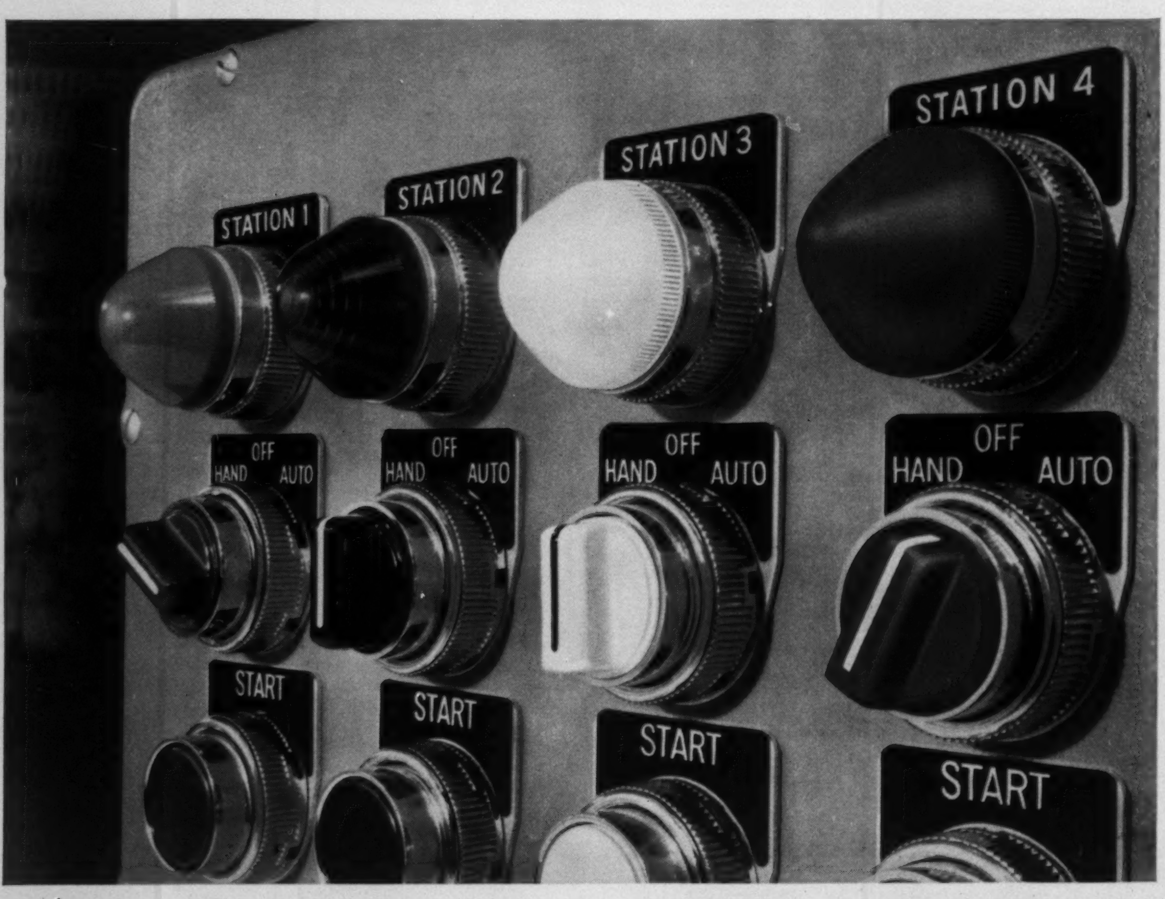
Color-coded control stations assure rapid identification of the individual control units minimizing the operator's chances for pushing the wrong button at the wrong time. Color-coded control stations also shorten the time required to train new personnel in the operation of your machines.

Check the control stations on your machines . . . be sure they are equipped with color-coded Cutler-Hammer 10250T Oil-Tight Control Units. They cost you nothing extra. Write today for the handy selection guide, Publication EL178-C213. Cutler-Hammer Inc., Milwaukee 1, Wis.



Interchangeable operating knobs on the new Cutler-Hammer Oil-Tight Selector Switches match the six distinctive colors of the 10250T Pushbuttons and Indicating Lights. A single set screw assures quick assembly. Mounts in any position, too.

**• RED • BLACK • GREEN**
**• YELLOW • GRAY • WHITE**



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